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Radiation Hazard: Fact or Fantasy?

Following recent reports of the National Academy of Science and the National Research Council and other scientific bodies, there appeared numerous articles in the lay press depicting dire consequences for the human race from the effects of the atomic energy program and in fact from all forms of radiation. Certain feature articles in lay magazines with wide circulations concentrated on the possible disastrous effects of medical radiography with varying degrees of sensationalism. While a few were informative and factual, too many contained obviously untrue or distorted facts or conclusions unsubstantiated by scientific data. The fear and apprehension developed in the population and even in some physicians can only be conjectured, but it is probably considerable. Such apprehension regarding medical radiography has resulted in the refusal of some patients to have necessary radiographic procedures and the reluctance of some physicians to order such studies even to the serious detriment of the patient.

The effects of radiation of the quality used in medical diagnosis and treatment are well known to the radiologist, and these effects have been studied for many years. They have determined, through their organizations and in association with other scientific organizations in the field of physics and radiobiology, standards of protection and have sought consistently to improve the quality of radiographic examinations while reducing the quantity of radiation required for necessary procedures.

What should the average patient think, however, when he reads in a popular magazine that all radiation is dangerous? Or consider the effect on the parents of a young child when they read that a chest film, a dental survey, or a series of x-ray pictures may produce changes in the child's gonads leading to sterility or deformed progeny perhaps one or two generations hence. These statements and others are definitely misleading, untrue, and based on unscientific data. Consider the statement that all radiation is dangerous. This is obviously untrue when made without any qualification as to dosage, quality, or other limiting factors. We live with radiation of one sort or another constantly, and indeed, all mankind has arrived at its present state of development in the presence of constant cosmic radiation and other background radiation from which there is and never has been an escape. The inference that the human life span is reduced by radiation in proportion to the dose received is not borne out by clinical experience or population studies. More people are reaching retirement age and in better health than ever before—more because of better medical facilities including radiography than in spite of them. Radiologists were formerly thought to have a decreased life span, and some early radiologists did die as a result of radiation accidents, but with better means of protection in current practice and with better education and understanding of radiation protection, more recent studies reveal that radiologists do have a normal or near normal life span.

Much has been written about the genetic effects of radiation on children and young adults in the childbearing age groups. This must be considered from two aspects: the effect on the individual and, more importantly, the effect from the long range viewpoint, on the mass genetic equilibrium. We must answer the following questions: Will necessary routine medical radiographic procedures produce demonstrable change in the gonads of the child or young adult, and will a general increase in medical radiography or increase in radiation in other forms disturb our present genetic equilibrium? Those who contend that radiation in even small quantities will produce a demonstrable change in the germ plasm of a child base these conclusions on experiments on the fruit fly, other insects, or small animals. No justification for such assumption is possible from reliable studies on man thus far. All available evidence from the survivors of Nagasaki and Hiroshima reveal no genetic damage in that these survivors have shown no more mutations than a similar segment of the population elsewhere in the world. The literature is replete with examples in which sterile mothers have become pregnant after stimulating doses of radiation to the ovaries. And full term normal infants have been born to mothers who have received 6,000 gamma roentgens or more to the cervix during pregnancy. Some of these children have been followed for two and three generations without showing any more abnormal progeny than the statistical average. There is much less evidence thus far to indicate genetic change in the human being from radiation than from toxic factors such as certain drugs, German measles, and anoxia to the fetus.

It is obvious that the total mass genetic equilibrium of our population should be maintained, and studies have been made to determine exactly how much more radiation from all sources is necessary to upset this equilibrium. In view of these studies, the suggestion made by some that certain mass procedures such as chest surveys, preemployment examinations of the spine, routine dental radiographs, and annual chest films should be discontinued is without any scientific justification. It is calculated that the amount of radiation delivered to the population in this manner, in fact by all medical radiographic procedures, is much less significant than that obtained by large segments of the population riding jet or other high altitude planes, living in certain mountain areas, or from the radiation used in industry, food processing, agriculture, or the atomic en-

ergy and military services. We know that certain foods are much more radioactive now than before the atomic energy program, particularly the dairy products, such as milk, cheese, and butter, and vegetables, because of the so-called fall-out of strontium 90. Radioactive determination of the antlers of deer taken in upland pasture regions in the past year, compared with antlers taken from the same areas before the first atomic explosion, show a ten-fold increase. The use of radium salts on dials of wrist watches and clocks in our homes accounts for much more radiation and exposure to the population as a whole than supervised diagnostic medical radiography.

It is admitted that not all radiographic machines in use today are safe, and in some instances x-ray procedures are being done by or under the authority of physicians, cultists, or in some instances even lay people who have neither the understanding, ability, nor training to make radiograms. Many have no knowledge of the physics involved in the production of x-radiation and consequently no knowledge concerning the protection to their patient, their personnel, those who occupy adjoining office space, or themselves. This shocking situation is due to the lack of any laws protecting the public from old obsolete equipment, unscrupulous individuals, and the many cultists who use the x-ray in one form or another to help them sell their own brand of medicine to the public. Just as the food and drug laws were necessary to protect the population from an unscrupulous minority, laws regulating and limiting the use of radiographic equipment to those trained in protection and the fundamentals of operation of such equipment, as well as laws requiring annual inspection of equipment, sooner or later will be found necessary.

As the need for more diagnostic procedures will increase, we must continue the improvement already made through better equipment, faster film and screens, image amplification, improved techniques, and better trained technicians, all of which are designed to promote better radiography with decreased amount of radiation dosage. Using the latest techniques and equipment, the dosage for a given gastrointestinal examination is about one-eighth that of a few years ago, and further decreases in dosage are likely in the near future without any decrease in quality of the examination. It seems probable that the increase in use of radiation in the medical and dental professions will be offset to a great extent by the decrease in dosage concomitant with improvements in equipment and techniques. We as physicians, however, should lead in the establishment of a comprehensive plan of control of radiation not only in the medical and dental fields but also encompassing industrial, agricultural, food processing, military, and all uses of forms of ionizing radiation.

—FRANCIS EDWARD O'NEILL, M.D., San Antonio.

Pulmonary Emphysema

Diffuse obstructive emphysema is principally a disease of middle age and later years. The increasing average length of life has led to a greater number of patients being afflicted with this disease. Every physician who undertakes to treat these patients should acquaint himself with the many aspects of this complicated disease.

There are many problems yet to be solved before our knowledge of emphysema will be adequate. The etiology itself is still a matter of controversy. Most investigators have thought that chronic bronchial obstruction, usually due to chronic bronchitis or severe asthma, was the principal cause. Others have felt the degenerative vascular disease of older years is the cause of emphysema, at least in some cases. Both factors may be important with one predominant in some cases and the other in other cases. The smoking habit has been considered important by many investigators, since it causes chronic bronchial irritation.

Modern methods in pulmonary physiology have brought to light the many physiological alterations in this disease. The chief defect is in ventilation with decreased vital capacity, especially the 0.5 and 1 second capacity, and decreased maximal breathing capacity. Loss of elasticity with bronchial obstruction leads to increased airway resistance on expiration and decreased lung compliance. Ventilation is more efficient in some areas than in others, producing uneven distribution of air. The residual volume is increased.

In some cases diffusing capacity may be decreased. The circulation may be affected because of disruption of alveolar septums, thereby decreasing the total pulmonary capillary bed. Hypoxemia and carbon dioxide retention occur in advanced stages. The latter may lead to respiratory acidosis, especially in the patients with acute infections who are given barbiturates and narcotics. The danger of incautious use of oxygen in this situation needs particularly to be emphasized.

Treatment of this disease taxes the ingenuity of the physician. A knowledge of the pathologic physiology involved is indispensable. Although the basic tissue damage is permanent, much can be done to give symptomatic relief. Most of the treatment is directed toward relieving bronchial obstruction. Antibiotics, mucolytic agents, and bronchodilators are very useful. These may be given orally, parenterally, or by inhalation. Steroids are helpful in some cases. Instruction in diaphragmatic breathing exercises enables the patient to breath more efficiently. The course of this type of emphysema tends to be gradually progressive. Frequent episodes of bronchitis or pneumonia seem to make deterioration more rapid. If these infections can be prevented with prophylactic therapy or treated intensively at the onset, the progression of the disease can be retarded and there may be no obvious change in the basic condition over long periods of time.

Although the treatment of emphysema is often discouraging to both the patient and the physician, the physician who uses every means to give the patient all possible relief and encourages him with an optimistic outlook will be rewarded with the gratitude of many who suffer from this disease.

—J. O. ARMSTRONG, M.D., Dallas.

The Positive Approach

"We are most likely to get angry and excited in our opposition to some idea when we ourselves are not quite certain of our own position and are inwardly tempted to take the other side."

These are the words of Thomas Mann, who wrote them years ago, but they seem apropos this spring of 1959, when members of the Texas Medical Association should congratulate themselves for being "quite certain" of their own position and for their constructive work in regard to proposed Texas legislation.

Texas doctors have sometimes, and perhaps justly at times, been criticized as being "nothing but aginners." They have sometimes considered themselves too busy to support worthwhile legislation, counting on "George" to do it, while stopping to throw their weight, either individually or collectively, only when it was apparent that the Texas Legislature might, through misinformation or misguidance, be about to pass a bill which would be detrimental to Texas patients, physicians, or other segments of the state's population.

During this session of the Legislature, however, Texas doctors as individuals and through their Association, have taken positive stands on a number of important health related bills.

They have supported a hospital licensing bill which would remove Texas from a group of only 3 states not having such requirements already. They have actively supported the "tissue bill," the passage of which will advance

greatly medical research in the state. The Texas Medical Association joined the Texas Tuberculosis Association in urging a complete recodification of antiquated tuberculosis statutes, and it has worked with several organizations toward a strengthening of Texas' drug and narcotics laws. Through their Association, Texas doctors have supported the movement to establish a medical examiner system.

On the other hand, there have been some bills in the current Texas Legislature which the Texas Medical Association, representing the doctors of the state, has been "agin" with good reason. These were bills which threatened further encroachment by government upon the private practice of medicine.

In regard to the latter legislation, it was also important that Texas doctors make themselves heard, not leaving the job to "George." For, as Dr. Wendell D. Gingrich of Galveston remarked in a January talk in Austin, "If you are inclined to let George do it, look over your shoulder for George and you will find your uncle, whose name is Sam, ready to tell you what to do."

If one word of caution can be included to doctors with a growing interest in legislative matters, it is this: Individual physicians who choose to take a different point of view from the official one of the Association are certainly free to do so. But they should be extremely careful to acquaint themselves with all the facts involved in the issue by checking with the Council on Medical Jurisprudence, the Association's general counsel, or the central office, and to make it clear to legislators upon whom they call that they are speaking for themselves and not for the Association as a whole.

When this issue of the *Texas State Journal of Medicine* went to press, pending action looked favorable on almost every bill actively supported by Texas doctors in the Legislature this session.

Congratulations, gentlemen!

★ Current Editorial Comment

Relationship of Doctors To Hospital Administrators

So much has been written about the hospital corporate practice of medicine and the lack of understanding, or appreciation, which the administrator has for members of the medical staff, that as an administrator, I am somewhat hesitant to discuss the relationship of doctors of medicine to hospital administrators. However, when I observe the close and growing cooperation between the Texas Medical Association and the Texas Hospital Association, I am persuaded that, like so many things, much of the friction is merely the misunderstanding of the other person's point of view.

As all doctors know, it is impossible to make a correct diagnosis without an adequate history and physical examination. So it is impossible to understand the present relationship of doctors and administrators without briefly considering how we arrived at our present association.

It has been authoritatively pointed out that there has been more progress in the art and science of medicine in the past 100 years than there was in the previous 2,800 years. Certainly, within our lifetime, we have watched a phenomenal change in the care of the patient.

During the early 1900's, hospitals were supported by philanthropy; today the patient is the paying consumer. Hospitals formerly were set up for long-term, sometimes terminal, care. The average stay for the patient in 1900 was some 30 days; in the middle 1930's it was 14 days; and today it is approximately 6 days.

The changes in the economic operation of hospitals, and specifically in departmentalization of hospitals, have been brought about by the widespread advances which science has contributed to the care of the patient. As hospitals developed from institutions relegated to long-term care into short-term care facilities, and as the doctor began to take care of most patients in the hospital, rather than in the home, the

problems of management became complex.

In 1930 the ratio of employees to patients was approximately 1:2; in 1940, this figure became 1:5; in 1950, 1:8; and today it is approximately 2:1. Predictions are that by the middle or late 1960's, the number of employees per patient will be approximately 3.

As hospitals have become more departmentalized, and the number of personnel has increased, management problems have increased.

The hospital presents a unique employment situation in that it is probably the only type of employment where the personnel are hired, fired, and paid by the institution and yet are directly responsible to another person—the attending physician. It is a wonder, when the hospital personnel environment is considered in this light, that the provision of patient care is not more difficult.

The rapid advances in medicine, the increased use of the hospitals by doctors, the extensive departmentalization of the hospital, the shortening of the patient stay, and the accompanying economic problems in health in our present-day society have presented a very unusual administrative situation. Since the field of hospital administration is relatively a new field, the need for this specialized endeavor has become apparent only within the last three or four decades. It has been only within the last 10 or 12 years that an adequate supply of individuals trained in hospital administration has been available to the field. Even then, the supply of trained people, plus those who have acquired their experience "the hard way," has not been sufficient to keep up with the number of hospitals being built to serve an unprecedented growth in population.

Another factor in this relationship is found in the unfamiliarity of many boards of trustees with hospital problems. This is understandable in view of the large number of hospitals built within recent years; the majority of these hospitals have been built in communities which have never before had hospital facilities.

All of these factors tend, in one way or another, to color the relationship of the doctor of medicine to the hospital administrator. How much coloring, and whether it be good or bad, depends largely upon the community and its place in the evolution of modern hospital care.

Fundamentally, the relationship of doctors of medicine to hospital administrators should be one of conscientious understanding and mutually dedicated teamwork. It is impossible to say that this is a doctor's problem, and that this is an administrative problem, when the only excuse for the existence of the hospital, or the profession of medicine, is good patient care.

It is true that this care of the patient has two distinct facets.

1. The hospital's responsibility is to provide an adequate plant and competent personnel to assist the doctor in his care of the patient.

2. The doctor's responsibility is the medical management of the patient and, most certainly, his recommendations for the establishment of professional policies to provide the proper atmosphere for that management.

From a managerial standpoint, the hospital administrator is responsible for the provision of those factors which comprise good hospital services; from the doctor's standpoint, he is responsible for making suggestions for the improvement of the professional aspects of those hospital services.

If we, as doctors and hospital administrators, can realize that the two professions should be working together, under an aura of mutual respect, toward the goal of good community service, then the relationship will be one of close teamwork—in essence, a partnership with each individual contributing the skills and understanding which he has developed.

It is the hope of the Texas Hospital Association, and it definitely has been the expressed desire of the Texas Medical Association, to work evermore closely in those areas of patient care which mutually affect both organizations.

—W. P. EARNGEY, JR., Fort Worth.

Mr. Earngey (President, Texas Hospital Association), Administrator, Harris Hospital, Fort Worth.

President's Page

A MOMENT FOR REFLECTION

DR. SMITH

It is with true humility that, reaching the end of my year as President, I join the ranks of those distinguished physicians preceding me who have led the Texas Medical Association. When one first comes into this office, he has great ambitions and a feeling that he will do great things. As he reaches the end of the term, he realizes how far short he has fallen of the goal he set for himself.

The program outlined a year ago has been carried out as aggressively and as enthusiastically as possible. The theme has been "A Better Informed Profession," and the home office staff, legal counsel and elected officials have crossed Texas many times carrying information to the membership.

Voluntary health insurance and its vital role in providing for the cost of medical care has been stressed wherever possible. We have been aided appreciably by intensely interested officials of Blue Cross-Blue Shield, the Health Insurance Council of Texas, and commercial carriers. We have attempted to educate the doctors in the value of insurance, to study the policies and know their contents. The public has been given every opportunity to learn about insurance—to realize that it is not possible to achieve total coverage because of the expense, but that protection for a portion of the illness can soften the blow. We must realize that the success of this program is with the doctor himself, with his patients, in his own office, and in his county society.

I am very proud of the Committee on Voluntary Health Insurance and Health Care Costs, which has done outstanding work in this field and, in my opinion, should be continued as a permanent committee. Five other committees have been established for the first time this year and deserve praise. These are the Committee on Medical Aspects of Automobile Injuries and Deaths, for which a new, shorter name is being suggested; the Committee on Spas, which is attempting to bring about a true evaluation of the use of spa therapy along with rehabilitation and physical therapy; the Committee on Military and Veterans Affairs, which has done a great deal of study in this growing area;

the Committee to Encourage and Assist Hospitals in Securing Accreditation, which is serving an admirable purpose; and the Committee on Reorganization, which is recommending vital realignment in Association committee structure.

The Texas Medical Association by its thoughtful evaluation of various legislative procedures has made itself felt in many ways. We have tried to insure a good rapport with our legislators and congressmen, taking them into our confidence and giving them information which is properly conceived, not just offered in heated discussions.

The Association has had wonderful cooperation with the Texas State Board of Medical Examiners, the Texas Public Health Association, the Texas and other hospital associations, and various other medical and paramedical groups. The Association also is developing good relations with the press. Our Texas newsmen have a common sense professional relationship with physicians and want us to show them the same faith that they show us.

Your President has appreciated the wonderful cooperation from everyone—my wife Ann and other members of my family, the central office staff, the legal counsel, the Trustees, Councilors, and other state officers, the many members of councils and committees, the officers and members of the Woman's Auxiliary, the paramedical groups, the press, members of the Legislature, and the physicians throughout the state who have given loyal and enthusiastic support. I am also grateful for the fine spirit of the best partners a doctor has ever had, the members of the Torbett Clinic staff, who have stood by me loyally and faithfully.

I would like to impress on all of us that we must be careful to perform our allotted tasks. We must serve faithfully, capably, sympathetically, and with reason, every day, as physicians and as citizens. Let us pledge to ourselves and each other a continuing sense of harmony, unity, and purpose, and a progressive program with its ultimate goal to give the best medical care to the people.

As Dr. George Turner wrote when the Texas Medical Association celebrated its hundredth anniversary: "If the past could speak, I am sure it would say: have faith in your cause; be happy in your work; be understanding of each other; be resolute in your aims, defiant in defeat, magnanimous in your victories; and bear good will to all whom you contact."

Howard O. Smith M.D.

ORIGINAL ARTICLES

Renaissance In Otology

W. P. ANTHONY, M.D.

Fort Worth, Texas

CHEMOTHERAPY and antibiotic therapy, as if by magic, revised the course of the pyogenic infections so dangerous in the past. As the internist marvelled at reduced morbidity in lobar pneumonia, the otologist marvelled at the changed clinical course of acute mastoiditis. That the otologist's destructive surgery of the past was to become virtually extinct was a foregone conclusion by the mid 1940's.

But even as the concept of the fall of otology slowly permeated the profession and well established residencies in otolaryngology went unfilled, the seeds of a new era were being quietly tended. The advances in chemotherapy and antibiotic therapy that happily ended the necessity for wholesale *destructive* procedures in otology were to make feasible many *constructive* procedures previously considered unsatisfactory because of infection. And the destructive era was to be replaced by a renaissance in constructive otologic surgery which was to advance on a broad front. In otology the term destruction was to be replaced by the word rehabilitation.

TYPES OF HEARING IMPAIRMENT

The external and middle ear conduct sound to the inner ear where it is perceived and converted into nerve impulses which pass by way of the auditory nerves and tracts to the cerebral cortex and consciousness.

Any difficulty in the external ear canal and middle ear which interferes with the conduction of sound is called conductive deafness. Any difficulty in the inner ear on the nerve pathways is known as perceptive or nerve deafness. When both the middle ear and inner ear mechanisms are involved, a so-called mixed deafness is present.

CONDUCTIVE DEAFNESS

Conductive hearing loss is almost invariably produced by one of the following causes:

1. Obstruction of the external auditory canal by impacted cerumen, debris, foreign body, or congenital and acquired atresia.
2. Perforation of the tympanic membrane.
3. Scarring of the drum and scarring or arthritis of the ossicular chain causing immobility.
4. Purulent otitis media.
5. Obstruction of the eustachian tube and/or allergy resulting in serous effusions of the middle ear.
6. Otosclerosis.

Acquired and Congenital Atresia.—The ear canal may be occluded by injury. In these cases the pathway of the ear canal may be reestablished by excision of the scars and application of skin grafts.[3]

In congenital atresia,[11] the deformity may be minimal or complete with external canal and ear drum replaced by bone. The middle ear may be practically nonexistant and development of ossicles only suggested. These deformities are corrected surgically by creating a new bony ear canal and making a new ear drum from skin grafts in such a way as to create a functioning conductive mechanism.

Such a procedure would be doomed to failure without control of infection made possible by antibiotics.

Tympanic Membrane Perforations.—The delicate tympanic membrane or drum head becomes perforated as the result of infections or injury.

Only since the advent of antibiotic prophylaxis

Dr. W. P. Anthony is a specialist in otology.

Chemotherapy and antibiotics, which almost eliminated the otologist's destructive surgery of the past, have made possible new rehabilitative surgery. Acquired and congenital atresia, tympanic membrane perforations, damage from middle ear infections and otosclerosis have become amenable in many cases to surgery. Better hearing aids benefit still other patients.

has the repair of large perforations been consistently satisfactory. The concept of myringoplasty and tympanoplasty is quite new. The basic techniques were pioneered by the Germans since World War II and quickly adopted and improved in this country.[14] The edges of the perforation are freshened and the epithelial layer of the remaining membrane is removed under the operating microscope and a skin graft applied over the perforation and denuded surrounding area. This procedure not only seals the middle ear from outside contamination but also reestablishes an intact vibrating ear drum.

Middle Ear Infection.—Replacement of partly or completely absent ear drums and middle ear ossicles is usually done under magnification with the operating microscope and under general anesthesia. This operation is basically a procedure to re-construct a partially or totally destroyed middle ear, which usually results from infection.[13]

Cleaning up infection prior to surgery is important, and surgery must sometimes be carried out in the presence of some degree of chronic infection. Antibiotics properly chosen on the basis of culture and sensitivity studies are indispensable to the success of these procedures.

Though relatively new, gratifying results are being obtained in improving hearing to serviceable levels as well as sealing off the middle ear from outside contamination and infection.[1]

Otosclerosis.—OTO (ear) SCLEROSIS (hardening) is the most common of the conditions causing conductive hearing loss. This condition is a dystrophy of the bone of the labyrinthine capsule. The pathological process can be widely distributed but causes hearing defects only when the newly formed spongy bone impinges upon the moving parts of the conductive mechanism. This occurs most frequently at the anterior rim of the stapedial footplate and causes a fixation of the footplate to the oval window rim.

Otosclerosis tends to be familial. It is more often encountered in females rather than males by a ratio of 2 to 1 and tends to be aggravated by pregnancy. The pathological process may progress rapidly or slowly or become completely inactive. It does not, fortunately, progress to total deafness.

Because this condition is poorly understood, no medical management or simple local treatment is available.

Since 1876, research and clinical trial have been under way in an effort to develop and perfect surgical treatment for otosclerosis.[7, 8] Progress was painfully slow and interrupted by periodic setbacks and loss of interest. Postoperative infections in the vicinity of the delicate labyrinth and meninges were the greatest obstacle to progress. Present day means of infection control, adequate illumination, and magnification have made surgery for otosclerosis possible. This has been the keystone of the resurgence in otology.

A procedure for by-passing the ankylosed stapes and allowing sound to pass into the cochlea by way of a window created in the horizontal semicircular canal was made practical about 20 years ago.[9] The fenestration or window operation has been considered really satisfactory for only about 10 years, since it has become about 85 per cent successful. Its main drawback has been postoperative vertigo. The development of Dramamine in parenteral form and the introduction of Thorazine and Compazine have decreased the postoperative morbidity dramatically and placed fenestration morbidity in the benign class of routine major surgery. The patient is routinely hospitalized 1 week and is away from his normal activities for an additional 2 to 3 weeks.

The stapes mobilization operation for restoration of hearing in otosclerosis differs from the fenestration in that the ankylosed stapes is directly approached and mobilized instead of by-passed. This procedure was practiced crudely before the turn of the century[10] but was abandoned until about 5 years ago when it was re-popularized by Samuel Rosen.[12] With the control of infection, illumination, magnification, and instruments that our modern technology has made possible, it has come to be a practical preliminary and often definitive procedure for the surgical treatment of patients with otosclerosis.

The stapes mobilization is done under local anesthesia so that subjective hearing tests may be used at various stages of the operation. The posterior half of the circumference of the ear drum is carefully separated from the bone and the back one-half of the membrane is folded forward exposing the stapes area. The stapes is gently and gradually worked loose by various manipulations. The ear drum is then replaced in its normal position and the patient frequently hears well immediately.

The patient usually leaves the hospital the next day and returns to normal activities 2 to 3 days after surgery. There is little or no postoperative morbidity, and the ear usually heals well.

The great advantage of the stapes mobilization is that when it is successful the patient has gained much for little discomfiture. In event of failure there is always recourse to the fenestration.[5] Approximately 65 per cent of stapes mobilizations result in improvement in hearing at present, and this figure is on the upswing.

NERVE OR PERCEPTIVE DEAFNESS

The term nerve deafness loosely encompasses a wide variety of defects of the cochlea or the nerve pathways from the cochlea to the cerebral cortex.

Most nerve deafness is based upon senile deterioration, trauma, or congenital failure of the cochlea to develop properly. Meniere's disease and acoustic neuromas may be treated rationally, but for the remainder of this large category there is usually no definitive treatment.

Even in this field, however, patients are being rehabilitated and living useful lives. This has come about through development of organized programs of instruction for the hearing handicapped and the technical advances in production of better and better electronic hearing devises.[6] Pre-World War II hearing aids were as different from today's instruments as the old prewar radios were from our present hi-fi sets. Facilities to aid the patient in the proper selection of an instrument and for related instruction are available today.[2]

SUMMARY AND CONCLUSIONS

A tremendous resurgence or renaissance in otology has occurred in the past 10 years in the field of surgical treatment for impairment of hearing. Advancement of fenestration surgery to the category of "reliable," the introduction of and popularization of stapes mobilization, myringoplasty, and tympanoplasty have been made possible by adequate means of illumination, use of the operating microscope, and primarily through the use of antibiotic agents for the control of infection.

These antibiotics, which were the principal force in the fall of otology as a prominent surgical subspecialty by their miraculous control of infection, have come full circle and have served as a stepping stone into a new era of constructive otology.

Those patients not able to benefit from surgical rehabilitation have been benefited by more and more satisfactory hearing aids made possible by advances in modern electronics.

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♦ Dr. Anthony, 705 Fifth Avenue, Fort Worth 4.

Relationship of Allergy and Infection to Secretory Otitis Media

HARRIS HOSEN, M.D.

Port Arthur, Texas

PATHOLOGIC LESIONS of the middle ear and inner ear are secondary conditions which are controlled by abnormal situations affecting the eustachian tube.

The interruption of the normal aerating function of the tube is followed by absorption of air in the middle ear and mastoid. This leads to a partial or complete vacuum which incites a transudation of serous fluid. An aborted inflammatory process of the eustachian tube will lead to an exudate which fills the middle ear or tympanic cavity. Either of these conditions of transudate or exudate filling the middle ear is known as secretory otitis media. The fluid content in this condition is usually sterile.

SYMPTOMS AND DIAGNOSIS

The symptomatology in brief of this condition consists of a feeling of fullness, stuffiness, or pressure in the ear. Tinnitus is a common complaint. Conductive deafness may be present in a degree that ranges from almost insignificance to complete deaf-

ness. Many patients will speak of a sensation of water bubbling in the ear. Younger children and infants may never complain, and the only indication of trouble will be noticed months later because of their progressive degree of inattention due to a progressive deafness. Again infants and children less than 4 years of age may exhibit signs of restlessness and frequently will pull at the affected ear.

A routine examination of the ear drums will lead to the diagnosis of secretory otitis. The tympanic membrane involved usually reveals an amber or yellow color. In long standing cases, the drum may have a bluish color. Some writers emphasize the chalklike appearance of the malleus handle and short process. Infrequently a fluid line and bubbles may be seen through the membrane. Frequently the drum is retracted to various degrees. Perhaps the best description of the drum in secretory otitis media is that the drum does not look normal.

CAUSES OF TUBE BLOCKAGE

The causes of eustachian tube blockage are varied. Any condition which is capable of producing swelling of the tubal mucosa, compression of the ostium or lumen of the tube, or in any way interfering with the normal aerating function of the eustachian tube may be an etiological factor:

1. Conditions which may cause a swelling of the mucosa of the eustachian tube are acute upper respiratory infection, acute and chronic sinusitis, chronic nasopharyngitis, and nasal allergy.

2. Compression or closure of the lumen of the tube may be caused by malignancies of the nasopharynx, enlarged lateral retropharyngeal lympth nodes, or hypertrophied adenoids.

3. Interference with the normal tubal function occurs with rapid changes of pressure on the other side of the drum as in rapid descent in an airplane.

By far the greatest cause of edema of the eustachian tube with a resulting secretory otitis media is infection. Nasal allergy plays a minor but a significant minority role in tubal edema.

Excessive adenoids are the most prominent cause of compression or closure of the tube.

The trigger mechanism which may precipitate a secretory otitis in the case of excessive adenoids is infection or allergy or the combination of both.

Both allergy and infection will cause an edema of the adenoids which may be just enough to complete the closure of the eustachian tube. If the adenoids are removed, there may not be recurrences in spite of repeated allergic or infectious flare-ups.

Most writers speak of secretory otitis as a disease which has become more prevalent since the advent of antibiotics. All are generally agreed that before the advent of antibiotics, many of the present cases of secretory otitis would have gone on to suppuration and rupture of the drum involved.

The real cause of the prevalence of this condition when due to infection is the failure to get bacteriological cures rather than clinical cures.

TREATMENT

The treatment of secretory otitis media should be directed to the removal of the edema of the mucous membrane of the tube. If this is accomplished, the tube will open and normal aeration will occur. With aeration the serous or mucous contents of the middle ear will be absorbed in the majority of cases even after many months' duration. If complete eradication of the infection is accomplished and the mucous membrane of the eustachian tube returns to normal, symptoms may persist in a minority of cases. This may be due to the fact that the mucous or serous content of the tympanic cavity has become thick and gelatinous with possible fibrous degeneration. In such cases, the drum must be incised and the contents of the cavity removed by suction, aspiration, inflation, or other means.

In my opinion, the use of myringotomy as a primary treatment of secretory otitis is not logical. Although symptoms may be relieved by this approach, it frequently is only temporary, for the condition will recur unless the eustachian tube returns to normal.

Primary attention should be directed to the tube and myringotomy held in reserve especially in early cases. In chronic cases where the contents of the middle ear have become gelatinous, myringotomy can play an immediate role.

ALLERGY AND INFECTION

This discussion is concerned with the role of allergy and infection or the combination as the causes of edema of the tube. But allergic conditions of the

Dr. Harris Hosen delivered this address before the Southwest Allergy Forum in Shreveport, February 23, 1958.

Infection is the chief cause of secretory otitis media with allergy an important adjunct. Cytological and bacterial examinations of nasal secretions will determine the role of allergy and infection and suggest the specific antibiotic or an antiallergic drug most suitable for therapy.

nasal passages frequently may be complicated by infections. Often a nasal allergy may not cause a significant edema of the tube without being triggered off by an infection. And again an infection may need the triggering mechanism of an allergy to lead to a tubal obstruction.

To determine whether an obstruction of the tube is due to an allergy, an infection, or a combination of the two, a cytological and bacteriological examination of the nasal secretions is necessary.

Before speaking of the abnormal, we first must consider the normal findings. The normal nasal cavities, sinuses, and bronchial tree are sterile. The bacterial flora which exists is isolated to the nasopharynx. When the antibacterial barriers are broken by lowered resistance of the nasal mucosa, the bacteria from the nasopharynx spread into the nasal cavities, sinuses, or bronchial tree. Secretions from the normal upper respiratory areas may have small but insignificant numbers of nonpathogenic bacteria which are of no real significance. The common nonpathogens are Staphylococcus albus, Staph. aureus B, diphtheroids, Neisseria pharynges, and Staph. aureous A. If spreads of such secretions show no microorganisms, or just a few, and a large amount of mucus, then the evidence is strong that one is dealing with a vasomotor disorder. The presence of eosinophils, of course, is diagnostic of an existing allergy. Stained smears of secretion examined under a microscope will give a clear-cut picture of whether an allergy, infection, or a combination exists. Pneumococci, Streptococcus hemolyticus, Hemophilus influenzae and parainfluenzae, and Klebsiella pneumoniae are found very rarely in the normal nose or sinus even in small numbers. The finding of such organisms even in small numbers strongly suggests the presence of infection.

One of the most significant manifestations of nasal, sinus, or bronchial disease is a discharge of secretions. This material may vary considerably in consistency, color, and amount. The color or amount of secretions in itself is not diagnostic of infection, no more than a cloudy urine is indicative of the presence of white blood cells.

After such an examination to determine whether an infection, allergy, or a combination is present, cultures should be made to determine the organisms causing the infection. Sensitivity studies are then essential to find the specific antibiotic which will eradicate the infection. These procedures are simple and can be carried out in the office with little trouble and less expense. In my experience with sensitivity tests, I have found that the correlation of these tests and clinical results has been almost perfect.

In my office laboratory during the year 1953, we kept records of 200 consecutive sensitivity tests, made from patients with respiratory infections. The findings were of great clinical significance:

1. Penicillin was specific in 10 per cent of the cases.
2. Streptomycin was specific in 33 per cent.
3. The combination of penicillin and streptomycin was specific in 30 per cent of the cases where both penicillin and streptomycin were negative.
4. Chloromycetin was 80 per cent specific.
5. Aureomycin was 60 per cent specific.
6. Terramycin was 70 per cent specific.
7. Erythromycin was 34 per cent specific.
8. Sulfonamides were 8 per cent specific.

One year later a similar series of tests showed that penicillin and sulfonamides were even less specific while the other antibiotics retained the same degree of specificity.

Now in 1958 a consecutive series of sensitivity tests numbering 200 cases showed a drastic change. The following illustrates the importance of this procedure:

1. Penicillin was 44 per cent specific.
2. Streptomycin was 56 per cent specific.
3. The combination of penicillin and streptomycin was 10 per cent specific when both penicillin and streptomycin were individually negative.
4. Chloromycetin was 61 per cent specific.
5. Aureomycin was 48 per cent specific.
6. Terramycin was 65 per cent specific.
7. Achromycin (not available in the previous series) was 63 per cent specific.
8. Erythromycin was 51 per cent specific.
9. Novobiacin (not available previously) was 52 per cent specific.
10. Panalba (a combination of Achromycin and Novobiacin, not available previously) in a limited series of 50 cases showed an 80 per cent specificity.

This evaluation of sensitivity tests clearly shows that the blind use of antibiotics will not obtain bacteriological cures in the majority of cases, and as a result of this, edema of the eustachian tube will persist and lead to the condition known as secretory otitis media.

When a patient has an acute upper respiratory infection, with or without therapy, that infection usually will subside within 2 weeks to such an extent that all evidence of infection may be completely missing on routine visual examination. Still a chronic infection in the nasal passages will often persist without visible evidence of secretions being present. It is this chronic infection which will cause an edema of the tube and thus lead to middle ear complications.

To determine whether an allergy or infection is present, secretions must be obtained from the nasal passages. If aspiration or forcibly blowing the nose does not yield any secretions, the use of a sterile platinum loop will obtain the necessary secretions for examination. The loop is passed from the posterior end of the middle turbinate across the roof of the turbinate. The secretions collected are placed on a slide, and a stain is made with Wright's or Hansel's stain.

If bacteria are found, a diagnosis of infection can be made. If eosinophils are found, an allergy is present. If both are found, a diagnosis of infection with allergy can be made.

After sensitivity tests are made, the proper antibiotic is prescribed and 3 days of therapy is given. The patient is reexamined on the fourth or fifth day, and if the secretions are free of bacteria, the condition is considered as cured. In the majority of cases in which evidence of otitis was present, the symptoms and signs will have disappeared when a sterile condition has been achieved. If symptoms and signs of serous otitis still persist and sterility has been achieved, it means that edema of the eustachian tube still exists. In such a situation the edema can often be relieved by two or three daily injections of ACTH. If this fails, paracentesis is indicated.

It is not unusual to find a pure infection on the original examination which after clearing will show microscopic evidence of an allergic condition. If ear symptoms still persist, presumptive evidence is that the edema of the tube is of allergic origin.

When eustachian tube edema is caused primarily by an allergic reaction, every effort must be made to clear the condition; but more important, the prevention of future tubal edema is essential. Specific allergic therapy is indicated in any persistent tubal disturbance or when there are recurrent attacks of temporary obstruction due to an allergy.

Symptomatic therapy consists of the use of antihistaminics, ACTH, cortisone derivatives, and other antiallergic drugs. In the majority of cases due to an allergic condition two or three daily injections of ACTH will relieve the edema, and the condition of serous otitis will clear. In some very persistent cases none of the antiallergic agents seem to work. Certainly in these cases, specific therapy is essential.

CONCLUSIONS

Eustachian tube edema or obstruction is the direct cause of secretory otitis media.

In cases of excessive adenoids, surgical removal is the final answer.

Infection is the greatest cause of tubal edema.

A bacteriological cure in upper respiratory infection will prevent middle ear complications.

The proper use of the specific antibiotics will obtain a bacteriological cure within 3 days of therapy. The choice of an antibiotic depends on the use of sensitivity tests.

Myringotomy is essential when the contents of the tympanic cavity have become gelatinous.

Allergy is important as an etiological factor, but first any complicating infection must be eradicated.

A pure allergic condition causing edema of the tube calls for specific therapy. Nonspecific therapy gives relief in most cases but does not prevent recurrences. With specific therapy gratifying results can be obtained and recurrences will be eliminated for the most part.

♦ Dr. Hosen, 2649 Procter, Port Arthur.

Tonsils—Take Them or Leave Them

HOMER B. FIELD, M.D.

Blue Island, Illinois

THE PALATINE TONSILS have been a bone of contention for the medical profession for many years. We have gone through a phase during which the tonsillectomy was performed because the tonsils were there—regardless of their pathogenicity or size or relation to other organs. Then we have leaned backwards and the tonsil was left in situ regardless of its effect on the patient's health.

It is the purpose of this paper to place the tonsil question in proper perspective and at the same time focus attention on certain problems related to the tonsils and adenoids. I believe (1) there are definite indications for adenotonsillectomy and (2) the surgical treatment of the adenotonsil problem should be placed on a surgical level as that of any surgical procedure.

FUNCTION OF TONSIL

Let us review for a minute the function of the tonsil. The structure of the tonsil is microscopically composed of stratified squamous epithelium overlying a connective tissue capsule with papillae. It forms deep crypts which almost extend to the other side of the capsule, which may have secondary branches. In this connective tissue there is always a variety of cells of different types; lymphocytes, mast cells, plasma cells, often in various stages of degeneration. Large numbers of neutrophils indicate inflammation. Small numbers of neutrophils are always present. Large numbers of eosinophils suggest allergy. The lumen of the crypts may contain large

numbers of degenerated lymphocytes mixed with desquamated squamous epithelial cells, granular detritus, and microorganisms. These masses may form large cheesy plugs which are gradually eliminated, or they may remain for a long time and become calcified.

Unlike the lymph node, the tonsil does not possess lymphatic sinuses, and the lymph is not filtered through them. They are provided, however, with netlike plexuses of wide, blindly ending lymph capillaries which do not penetrate the lymphoid tisssue, but merely surround its outer surface. The tonsils reach maximum development in childhood and usually begin to involute at the age of 14 or 15 years. The participation of the tonsil in the production of lymphocytes is the only firmly established function that can be ascribed to them. The infiltration of the epithelium by lymphocytes is characteristic of the tonsil as it is of the entire digestive tract—the tonsils in the pharynx, diffusely in the wall of the small intestine, and in solitary follicles and patches of Peyer in the intestines. The physiologic meaning of this phenomenon is not entirely clear. This infiltration process is generally believed to have something to do with the penetration of micro-organisms into the body. Pathogenic bacteria have been found in the lymphoid tissue of the tonsils and the lymphoid follicles of the intestine as an apparently normal phenomenon in man and animals. It has been suggested that these bacteria penetrating into the lymphoid tissue are modified and made less virulent and they then act like vaccines and instigate the promotion of antibodies. On the other hand, the tonsil as well as the follicles of the intestine have been shown to be portals of entry for pathogenic bacteria and general as well as local infections have been traced from them.

It is when the tonsil succumbs to the noxious agent that intervention by surgery or other therapy is indicated.

Dr. Homer B. Field, practicing ophthalmologist and otolaryngologist, presented this paper for the Texas Academy of General Practice on September 22, 1958, in San Antonio.

The indications for adenotonsillectomy include (1) mechanical obstruction due to hypertrophy, (2) persistent middle ear disease, (3) persistent systemic problem with the tonsil an exciting toxic factor, (4) tumors of the adenotonsil area, (5) persistent diphtheria culture in the throat. Adenotonsil operations deserve good technique and probably still should not be done during an active poliomyelitis outbreak.

TREATMENT

In most instances diseased tonsils which formerly were subjected eventually to surgery have been managed medically with good results. The use of radiation for control of hypertrophic adenotonsillitis has been in general disappointing, and the danger of producing persistent and permanent radiation effects cannot be ignored.

Various other techniques for tonsil therapy have been used at various times. Electrocoagulation of the tonsil was very popular as a means of therapy as was irradiation with the ultraviolet quartz lamp. Autogenous vaccines made from the organism found in the tonsil crypts have been employed. While these various forms of therapy have their advocates, the medical profession generally, I think, advocates surgical excision as the procedure of choice in the treatment of persistent adenoid and tonsil disease.

It is important to recognize the diseased tonsil and have certain definite criteria for its surgical removal. Usually, the indications for adenotonsillectomy are five:

1. Mechanical obstruction due to hypertrophy. This hypertrophy and hyperplasia of the lymphoid elements may be the result of (a) recurrent infection, (b) allergy, or (c) congenital make-up of the individual. If the obstruction is sufficient to produce respiratory or deglutition difficulty, the adenotonsillectomy should be performed.

2. The presence of persistent middle ear disease, with or without effusion. It must be realized that infection of the middle ear is by and large a result of the presence of infection in the nasopharynx. The chief source of this infection is the tonsil and adenoid. The obstruction of the eustachian tube orifice must be relieved if the diseased ear is to be given normal chance of recovery from the impaired hearing produced by this problem.

3. A persistent systemic problem created by foci of infection with the tonsil thought to be an exciting toxic factor, such as rheumatic fever.

4. Tumors of the adenotonsil area which are a definite surgical problem. As a rule, removal of malignant tumors must be accompanied by radical neck dissection with removal of cervical nodes on the side affected.

5. Persistent diphtheria culture in the throat. This condition is seen more commonly in some sections of the country than others.

It is a common belief that the adenotonsillectomy is a waning surgical procedure; nevertheless, when we realize that this operation accounted for 20 per cent of all surgical procedures done in the country in 1956, it assumes considerable importance. In my region, the Chicago area, we average 1 death every 3 weeks from tonsil and adenoid operative proced-

ures. The greater New York area averages 2 deaths every 3 weeks for the same procedure.

The otologist is probably responsible for an increasing number of tonsillectomies because of his interest in loss of hearing. Although tonsils, as a result of enlargement or severe infection, are a factor in hearing loss, they are offenders not nearly as often as the adenoids. The otologist is faced with a difficult decision in the child who has an allergic background and, in addition, harbors active infection in the lymphoid elements of the nasopharynx. Should the adenoid tonsil tissue be removed and the allergy neglected, or should allergy control alone be used in hopes of controlling future infections? It is probably wise to attend to both factors. Removal of infected tonsils and adenoids frequently will have a quieting effect on an allergic mucous membrane. Certainly recurrent middle ear disease calls for a thorough removal of infected lymphoid tissue present.

Adenoid and tonsil tissue, present at birth, generally increases in size until the child is about the age of 3 years, after which there sets in a retrograde process with almost complete elimination of the adenoid tissue and a reduction in the size of the tonsils. The normal process may be altered, however, in the presence of abnormal conditions of infection or allergy. These two phenomena will lead to a hypertrophy of the tissues and resulting chronic infection. This will then cause the physician to remove the diseased tissue. Many children have been considered to be retarded when actually the problem is one of faulty and defective hearing because of persistent blockage either in the middle ear with an effusion of fluid or in the eustachian tube by mechanical obstruction with actual adenoid or tonsil tissue. Classifying an intelligent deaf child as a mentally retarded person occurs too frequently. Fortunately now the school systems are taking cognizance of this problem, and hearing defects are being found readily by screening techniques in the schools.

There is apparently no relationship between the incidence of upper respiratory tract infection, including the common cold, and the presence or absence of the tonsils.

TONSILLECTOMY AND POLIOMYELITIS

The relationship between bulbar poliomyelitis and tonsillectomy is one that still requires clarification. The analysis of the Minnesota epidemic of poliomyelitis of 1946 showed the increased incidence of bulbar poliomyelitis by some 3 to 1 in the person who had had tonsillectomy. It seems probable that invasion by the polio virus in the unhealed tonsillectomy area may account for increase in the bulbar type of polio. It is difficult for me to see how a tonsillectomy done years previously could be a factor in producing bulbar polio. It is probable that there is a common factor responsible for both the condition requiring tonsillectomy and the bulbar poliomyelitis. This factor might be a deficient defense mechanism against invasion of the upper respiratory tract by infections of the virus type. During the past three or four decades, adenotonsillectomies have been performed in the hope of preventing the common cold.

The big problem that faces the medical profession in the light of the Salk antipoliomyelitis vaccine is: "Should we remove the adenoids and tonsils, and when should it be done in relation to the open poliomyelitis season and in relation to the administration of the vaccine?"

Admittedly the experimental relationship between the throat and poliomyelitis is not known. Later work, in fact, is tending to point to the gastrointestinal tract as the principal source of entry for the virus. It has been customary for the past several years in the various states to suggest that the local hospitals put a definite quarantine on adenotonsillectomies and elective throat surgery during the periods when poliomyelitis was prevalent. The question then arose as to the efficacy of the Salk vaccine, as to the length of the immunity, and the percentage of individuals who failed to become immunized even after 3 doses of the vaccine.

In an attempt to get an over-all picture of the custom, in the absence of established fact, I made a survey of all 49 states, and the District of Columbia. A questionnaire was sent to each state department of health or state medical director in June, 1958, asking for the official reaction to the doing of elective throat surgery since the advent of the antipoliomyelitis vaccine. The replies are recorded in table 1. There were no answers from 6 states; 10 have no policy; 14 prohibit tonsillectomies and adenoidectomies during the summer season; 20 states reported confidence in the poliomyelitis vaccine to permit adenotonsillectomies whenever needed. The attitude expressed by Dr. Henry A. Holle for the Texas State Department of Health is to be commended: "The decision to operate at any time must be left to the clinical judgment of the private physician."

It is obvious that there is still much to be learned and disseminated to the medical profession regarding the efficiency of the vaccine. A pertinent excerpt from the World Health Organization report of 1957 is as follows:

> Elective tonsillectomies and adenoidectomies have been forbidden in many communities during the "poliomyelitis season" or during epidemics of poliomyelitis because of evidence indicative of an increased risk of acquiring bulbar poliomyelitis. The mechanism here is believed by some to

involve actual contamination of the nerves with poliovirus present in the pharynx. Since immunization with inactive poliovirus vaccine has been found to have no significant effect on the excretion of poliovirus in the stools, it is possible that in vaccinated individuals with low levels of antibody there may also be no interference with multiplication of virus in the pharynx. Accordingly, it was the opinion of the committee that, at least until evidence to the contrary is accumulated, it would be advisable to *continue the prohibition* of elective tonsillectomies and adenoidectomies during the so-called "poliomyelitis season."

From the foregoing it appears that, in general, over the country there is increasing feeling that in the properly vaccinated individual, adenotonsillectomy may be done except where there is an existing epidemic of polio. It would seem that time alone will tell the entire story on the efficacy of the vaccine.

TABLE 1.—*Reaction of State Departments of Health to Doing of Elective Throat Surgery Since Advent of Antipoliomyelitis Vaccine.*

State	Policy
Alabama	Opposes adenotonsillectomy during polio season unless attending physician feels surgery is urgent.
Arizona	Recommends no adenotonsillectomies during polio epidemic.
Arkansas	No policy. When inquiry is made, recommends postponement until after polio season.
Colorado	No restrictions if vaccinated. No vaccinations, no adenotonsillectomy June 15 to September 15.
Connecticut	Prohibits adenotonsillectomies June 15 to October 1.
Delaware	85% children vaccinated with polio vaccine. No restrictions as to adenotonsillectomy.
Washington, D. C.	D. C. General Hospital prohibits adenotonsillectomy during season. Children's Hospital permits adenotonsillectomy if child is vaccinated.
Florida	Recommends no adenotonsillectomies in community where active cases of polio are present.
Georgia	Recommends no adenotonsillectomies during polio season, unless physician deems it necessary.
Idaho	No policy.
Illinois	Prohibited during polio season and for 30 days following polio inoculation.
Indiana	No state policy. In general, local county societies discourage elective ENT procedures in summer months.
Kansas	Recommends no elective nose and throat surgery during polio season.
Kentucky	No policy.
Louisiana	No policy.
Maine	Adenotonsillectomy at any time in immunized children. Recommends postponement when active polio cases are found.
Maryland	Adenotonsillectomy permitted in vaccinated children unless a severe epidemic is present.
Massachusetts	Restriction statewide now discarded, local hospital and physician decide the question.
Michigan	No official policy. Left to discretion of physician.
Minnesota	No general directive. No prohibition. Recommends no adenotonsillectomies until after polio season.
Mississippi	Recommends no adenotonsillectomies during polio season.
Missouri	Recommends no adenotonsillectomy during open polio season.
Montana	Prohibits adenotonsillectomies when active polio is in area.
Nebraska	No official policy.
New Hampshire	No restrictions on adenotonsillectomies.
New Jersey	No contraindication to adenotonsillectomy in community where there is no incidence of polio. Recommends delay if procedure is elective until after polio season.
New Mexico	Elective nose and throat surgery forbidden during polio season.
New York	Advises against doing adenotonsillectomies during polio season.
North Carolina	No policy.
North Dakota	No restriction on adenotonsillectomy if child has been vaccinated.
Ohio	Restrictions on adenotonsillectomy are placed only if active polio cases are found.
Oklahoma	Adenotonsillectomy permitted in immunized children. No surgery in nonimmunized.
Oregon	Permits tonsillectomy at any time in properly vaccinated person.
Rhode Island	Recommends postponement of surgery until after polio season.
South Carolina	Do not recommend adenotonsillectomy during open polio season.
South Dakota	No policy.
Tennessee	Elective nose and throat surgery prohibited during polio season.
Texas	No official attitude. Present day drugs have made this an elective procedure; hence a decision to operate at any time must be left up to surgeon.
Vermont	Recommends no adenotonsillectomies during polio season.
Virginia	No restrictions in vaccinated persons. No surgery June through September for nonvaccinated.
Washington	Restricts all elective nose and throat surgery when there is active polio epidemic. Permissable at any other time.
West Virginia	Recommends no adenotonsillectomies during season, but discretion of physician is relied upon.
Wisconsin	No set policy. Upon questions from physician recommends delaying adenotonsillectomy during polio season.
Wyoming	No state policy. Controlled by local areas. In general adenotonsillectomy is permitted at any time in properly vaccinated children.

No replies from Alaska, California, Iowa, Nevada, Pennsylvania, Utah.

SURGICAL TECHNIQUE

If one has decided on the removal of tonsils and adenoids, what is the best technique for such removal?

As in all surgery, anesthesia is important. I believe the safest mode of general anesthesia for adenotonsillectomy is the endotracheal type. The advantages of this type of anesthesia for this type of surgery include: (1) a continuously patent airway, (2) nonvarying level of anesthesia which may be kept light so that protective laryngeal reflexes may become active rapidly after operation, (3) less likelihood of aspiration difficulty of blood, tissue, or other foreign material, (4) improvement in visualization of the field of operation because of freedom of retraction of the tongue allowed by the presence of the tube. This type of anesthesia requires the services of a trained anesthetist or anesthesiologist.

The essence of good surgery is speed with a minimum of trauma to tissue. The careful excision of the tonsil should leave a clean tonsil fossa, both anterior and posterior pillars intact, the uvula in position. Evaluation of the child for a possible submucous cleft should be performed before adenoidectomy. This child may develop a nasal voice when the velopharyngeal closure is disturbed. One is dismayed at the frequency with which he sees marked distortion of the nasopharynx as a result of tonsil surgery. Many times there is a distracting change of voice in these cases. All bleeding points must be controlled. The clean tonsil fossa is still the best guarantee against post-tonsil bleeding. Certainly, if postoperative suturing of tonsil bleeding is necessary, a clean tonsil fossa makes this a much easier task. The use of sutures to close the tonsil fossa after surgery is not without its complications.

A word about adenoid surgery. The blind removal of adenoid tissue many times produces a very inadequate adenoidectomy. For this reason it is to the operator's advantage to examine the nasopharynx directly, and the use of a dental or laryngeal mirror for this purpose is satisfactory. It is a good practice to introduce the finger, covered by gauze, up into the nasopharynx and use this as a curette in the area of the eustachian tube recesses.

The preoperative care of the adenotonsillectomy case should be similar to that for any other surgical case. Many hospitals still do a bleeding time and coagulation time determination as the only requirement to adenotonsillectomy. I believe that this test tells us little and prefer to have a complete blood count and urinalysis as the minimum requirements for preoperative laboratory work. The use of an antibiotic at the time and immediately prior to and after surgery is probably good prophylaxis for infection. The use of blood coagulants as a routine is not necessary, except in the child recently on excessive use of oral antibiotics with failure in the natural production of vitamin K due to sterilization of the intestinal tract. In the day of the oral antibiotic and the busy doctor, it is easy to call a druggist and arbitrarily start antibiotic therapy for almost any complaint. A disservice is done to the child who does not have the opportunity to develop natural immunity.

SUMMARY

There are definite indications for adenotonsillectomy. When these indications are there, surgical removal should be accomplished with speed and dexterity and with minimal trauma to tissue. While indications are that the Salk vaccine renders tonsillectomy safe at any time of the year, there are questions remaining unanswered, so it is still probably wise to refrain from adenotonsillectomy during an active poliomyelitis outbreak in a given community.

Dr. Field, 2505 W. Burr Oak Avenue, Blue Island, Ill.

Nuclear Propulsion

Cataractogenic Effects From Fast Neutrons

JOHN E. PICKERING, COL., USAF

Randolph Air Force Base, Texas

and D. V. L. BROWN, M.D.

Chicago, Illinois

WITH TODAY'S concerted research into new vehicles and the associated propulsion systems, there is a challenge to harness the tremendous energy potential available from controlled fission reactions.

It is, however, not as simple as quoting the superiority of nuclear versus chemical fuels. The problems are formidable indeed, and they are not singularly engineering; for whether the vehicles are manned or unmanned, the human operator is involved.

For several years emphasis has been placed upon predicting the effects of ionizing radiation (fundamental to the fission process) on man, particularly where the radiation exposure may be somewhat

greater than our present day peacetime tolerance limits. Furthermore, dose schedules just below which minimal demonstrable biological changes will take place may become increasingly important if full utilization of nuclear energy is to proceed.

Over the past 10 years considerable radiation data have been accumulated from among the survivors of Hiroshima and Nagasaki, accidental exposures within Atomic Energy Commission installations, the therapeutic administration of radiation to certain selected cancer patients, and vast numbers of laboratory experiments. It has been demonstrated that radiation can and does produce early lens abnormalities, mature cataracts, bone marrow changes, and, in sufficiently large doses, shortening of life.

The findings that follow are related primarily to the cataractogenic effects of fast neutron irradiation.

Col. John E. Pickering, USAF, is with the School of Aviation Medicine at Randolph Air Force Base.

In efforts to determine the effects of ionizing radiation on man, 24 small primates were exposed to 14 mev neutrons. Fourteen mev neutrons produce biological changes including mature cataracts. Nevertheless, doses required to produce a mature cataract are of sufficient magnitude that other radiation effects of more serious consequences will precede the incapacitating effects of mature cataracts.

RADIATION EXPOSURE

One phase in a series of our long term radiation experiments involved 2 to 3 year old small male primates (Macaca mulatta) exposed to 14 mev neutrons. Twenty-four animals were divided into four dose groups—0, 75, 250, and 850 rep; all animals appeared healthy and had free access to food and water up to the time of irradiation.

During radiation exposure, the animals were positioned, three at a time, around the stainless-steel target of a Cockroft-Walton generator so that the target distance was 10 cm. from the center of the sphere to the zygoma at the outer canthus. The target, 4 cm. in diameter, contained zirconium sponge metal which absorbed the target gas tritium. A deuteron beam of approximately 90 microamperes was generated, focused through a tungsten diaphragm, and bombarded the tritium so that $_1H^3 + _1H^2 \rightarrow _2He^4 + _0n^1$ (14 mev). The exposure data are shown in table 1.

TABLE 1.—*Exposure Data in a Radiation Experiment Using Macaca Mulatta.*

Group	n/cm^2	Dose (rep)	Rate/hr. (rep)	No. of Animals
1	0	0	0	6
2	1.5×10^{10}	75	550	6
3	5×10^{10}	250	550	6
4	17×10^{10}	850	550	6

RESULTS

The small primates receiving 850 rep demonstrated immediate postradiation changes of conjunctival and retinal vasodilatation, subconjunctival hemorrhages, papilledema, retinal edema, and occasionally vasospasm. All of the animals showed a massive cellular response in the anterior chamber, but no hyphema or hypopyon appeared. Subsequently total desquamation and epilation occurred (table 2).

By the sixth month the first radiation changes, 20 to 40 very small, round, white vacuole-like opacities confined to the posterior subcapsular area, were observed in the lenses of 3 animals of this group. In the remaining animals, lymphedema or corneal changes precluded examination in 2, while the third primate displayed massive, relatively recent bilateral anterior chamber hemorrhages with hyphema.

From the sixth to the ninth month a gradual increase in the number of posterior subcapsular vacuoles and granules occurred, and at the end of 10 months the entire posterior subcapsular area was diffusely and evenly covered with fine granules and a few small vacuoles. A rather dense mass of opacities persisted in the central area.

By 12½ months the posterior subcapsular zone in all animals had multiple clumps, each consisting of 20 to 30 very small vacuoles in addition to the hundreds of small vacuoles and granules scattered throughout this layer. These clusters were located, however, in differing areas in the various subjects.

The anterior subcapsular area at 14 months showed 200 to 300 small scattered granules and a similar number of varying sized vacuoles. The posterior subcapsular opacities were relatively unchanged, although the clumps of opacities were more numerous and covered more of the capsular area.

The group of subjects receiving 250 rep of fast neutrons underwent similar early postradiation changes as those in the 850 rep group, but were of much less severity and were somewhat delayed in their onset. True epilation did not occur, nor did desquamation.

Lens opacities were first observed in the twelfth month following radiation and affected the anterior and posterior subcapsular areas simultaneously. Most

TABLE 2.—*Early Radiation Changes.*

Dose	Days Post-radiation	Erythema	Epilation	Desquamation	Iridocyclitis	Conjunctival Pigment Proliferation onto Cornea
1.7×10^{11}	0	0	0	0	?	0
(850 rep)	5	+	0	0	+	+
	15	+	+	+	+	+
5×10^{10}	0	0	0	0	?	0
(250 rep)	5	0	0	0	0-+	+
	15	+	0	0	0	+
1.5×10^{10}	0	0	0	0	0	0
(75 rep)	5	0	0	0	0	0
	15	0-+	0	0	0	+-

0 = No observable change.
+ = Observable change.

TABLE 3.—*Latent Changes.*

Radiation Type and Source	Date of Exposure	Total Dose	Earliest Lens Opacities (Mo.)	Degree of Opacification	Time Post-radiation	Possible Future Progression
Fast neutrons (14 mev neutrons)	4 Nov. 1953	850	6½	4+ (mature 20 mo.)		
Cockroft-Walton		250	14	2-3+	4½ yr.	Arrested
Accelerator		75	19½	1+	4½ yr.	Arrested

of the animals showed a tendency for the opacities to be more numerous in the central one-third.

Twenty-six months after exposure, there were more than 100 anterior subcapsular opacities with some tendency to accumulate in the axis. Posterior subcapsular vacuoles and granules numbered several hundred, and showed further lateral spreading with an increase in density of the axial mass.

Subjects exposed to 75 rep of fast neutrons showed only mild immediate changes after radiation. Thus, at 24 hours a slight transient skin reddening was apparent, with minimal conjunctival and retinal vasodilatation. No cellular reaction in the anterior chamber was seen.

Several of the subjects showed suspicious changes in the anterior and posterior subcapsular areas at 13 months following exposure. To the present time there has been no marked increase, and it is improbable that these will progress to the more characteristic radiation changes. Table 3 summarizes the latent effects.

CONCLUSIONS

Fourteen mev neutrons are effective in producing biological changes to include mature cataracts. Of particular note, when comparisons are made between 14 mev neutrons and other forms of ionizing radiation, it is apparent that fast neutrons are more effective in producing lens abnormalities than are roentgen rays, gamma rays, and/or thermal neutrons. Furthermore, they demonstrate a greater relative biological effectiveness for several other radiation changes (table 2). Nevertheless, to apply realistically the results of these cataractogenic threshold studies in terms of fast neutron exposures resulting from the operation of a nuclear propulsion system of practical value, one must conclude that neutron damage to the lens of the eye is not the limiting factor. The doses required to produce a mature cataract are of sufficient magnitude that other radiation effects of more serious consequences will precede the incapacitating effects of mature cataracts. As a matter of fact, it appears that the localized neutron dose required to produce significant numbers of opacities is greater than, or certainly approaches if administered whole body, the radiation dose considered to be the LD^{80}_{50} for man.

Colonel Pickering, School of Aviation Medicine, Randolph Air Force Base, Texas.

Dr. Brown, Carlson Building, 636 Church Street, Evanston, Ill.

Although the number of cases of paralytic polio in the United States last year increased by one-fourth over 1957, most epidemics in 1958 centered around groups where use of the Salk vaccine lagged. "The evidence is now overwhelming," says Health Information Foundation, "that the full series of three or more Salk inoculations provides a high level of protection from paralytic polio." Morover, "No break in the safety of the vaccine has shown up since 1955."

The Present Status Of the Problem Of Weightlessness

COL. PAUL A. CAMPBELL, USAF (MC), and SIEGFRIED J. GERATHEWOHL, Ph.D.

Randolph Air Force Base, Texas

WITH THE ADVENT of extra-atmospheric or space flight a number of new situations will arise to confront the traveler for the first time, whether he be pilot, crewman, or passenger. Among them are the hazards of cosmic radiation, the problem of a hitherto unsuspected form of electromagnetic radiation (Van Allen type), life in a closed ecologic loop, and many other conditions having biological implications. An interesting problem is that produced by the weightless state or zero "G."

Permanent weightlessness results when a body launched from the earth reaches a velocity of approximately 5 miles per second. At that velocity the centrifugal "fly away from earth" tendency of the body or vehicle exactly counteracts the centripetal or "fall to earth" tendency resulting from the earth's gravitational pull. Under proper conditions this produces an orbital flight path about the earth. The satellites such as the Explorers and the Sputniks are or have been orbiting about the earth by virtue of this phenomenon. As long as they encounter no friction of any form such as remnants of the earth's atmosphere or meteoritic material, they remain in orbit. If velocities are greater than 5 miles per second, the orbit is extended into an ellipse which extends further and further into space as velocity increases.

When human orbital or space travel becomes a reality, as many of us feel it will, the occupants of the vehicles will have the force of gravity removed from their bodies and organs in all vectors for the first time. We who live on earth have evolved and have lived in an environment of the gravitational pull of the earth's mass spoken of as 1 "G." Consequently, this situation for the most part will be a new one.

As is shown in figure 1 there are experiences which many of us have had which have placed us in a weightless situation for periods of a few tenths of a second. A few of us have been in situations which have extended the time up to 30 to 40 seconds. Most of us have dived from a springboard.[5] The arc described from the board to the water is a parabola. To be more precise, it is a trajectory, first mentioned by the astronomer, Johann Kepler, in the seventeenth century. At the top of the diving parabola, the performer was in the weightless state for possibly a tenth of a second. If this parabola is stretched horizontally by several feet and speed is increased considerably, we have a second situation exemplified by the top of an arc of an amusement park roller coaster. At the top of such an arc an occupant is weightless or in the gravity-free state for a few tenths of a second. Again, if we stretch the parabola horizontally still further, we can produce a flight path suggested by Haber and Haber[15] as a means of simulating the gravity-free state in high performance aircraft for periods of many seconds. In the final example we must again think in terms of an increase in speed with the parabola in this instance stretching beyond the edge of the earth. If the speed is 5 miles per second or more, the vehicle always will "free-fall" beyond the edge of the earth, never to return to the earth unless friction of the earth's atmosphere or collision with meteoritic particles slows it down to a velocity of less than 5 miles per second. At this velocity it will spiral into earth just as the Sputniks. Thus, the satellites themselves are in the gravity-free state as is every object on board. If there were human occupants, they would be gravity-free and each of their body functions would take place without the aid or the hindrance of the force of gravity.

As the weightless state has many implications, biological[3] and otherwise, it is the duty of those interested in attaining orbital flights above the earth's atmosphere, lunar flights, or possibly interplanetary flights to delineate the problems it interposes, determine possible associated human limitations, and attempt to devise protective measures.

Such studies are being made at the School of Aviation Medicine, Randolph Air Force Base. In lieu of better simulators, which probably will not be available until a satellite laboratory has been devised,[6] high performance aircraft with subjects aboard are flown at relatively high speeds in Kep-

Col. Paul A. Campbell is chief of the Space Medicine Division at the School of Aviation Medicine at Randolph Air Force Base.

Space flight has brought about new problems, some of which have biological implications. One of these is that produced by the weightless state. Weightlessness from the point of orientation, control, space sickness, cardiodynamics, and nutrition and elimination is discussed.

lerian parabolas. The aircraft used in such studies at the School of Aviation Medicine was at first a Lockheed T-33A and later a Lockheed F-94C type jet airplane. After preliminary flight tests it was found that the best working altitude for both aircraft was between 17,000 and 25,000 feet because of the usual lack of turbulence and clouds at this height and because of the safety factor in the event of an emergency.

Two different flight patterns then were employed. The first consisted of a certain number of parabolas started at an altitude of about 21,000 feet with the T-33 (fig. 2), and at about 23,000 feet with the F-94. After a shallow dive to 17,000 feet, the pilot pulled the aircraft up so smoothly that the "G" forces did not increase markedly. He then put the aircraft into a 60 degree climb at full throttle and initiated a pushover by a slight push of the stick, using the centrifugal and inertial effect for counteracting the gravitational pull of the earth. By flying the airplane through an outside loop on a parabolic course, he produced virtual weightlessness for about 15 to 20 seconds. The subjective experience of increased weight before and after the weightless state (during the pull-out) was slight and in some cases not noticed because of the large radius and slow rate of change of acceleration.

The second flight pattern consisted of a series of two or three parabolas in a row. At 20,000 feet a sharp dive was started, and the aircraft nosed down at an angle of about 65 degrees. Then the plane was pulled up rather abruptly, resulting in a 3 "G" acceleration. With the higher climbing speed available, a longer parabolic arc was obtained. Recovery at 17,000 feet provided the necessary acceleration for the upswing into the next parabola. In this maneuver, the occupant was subjected to a sequence of relatively high and sharp increases of acceleration and longer periods of weightlessness than in the first maneuver. The duration of the subgravity period now averaged about 30 seconds; and in one experimental flight using the afterburner of the F-94, a period of 43 seconds at or close to zero "G" was obtained.[11]

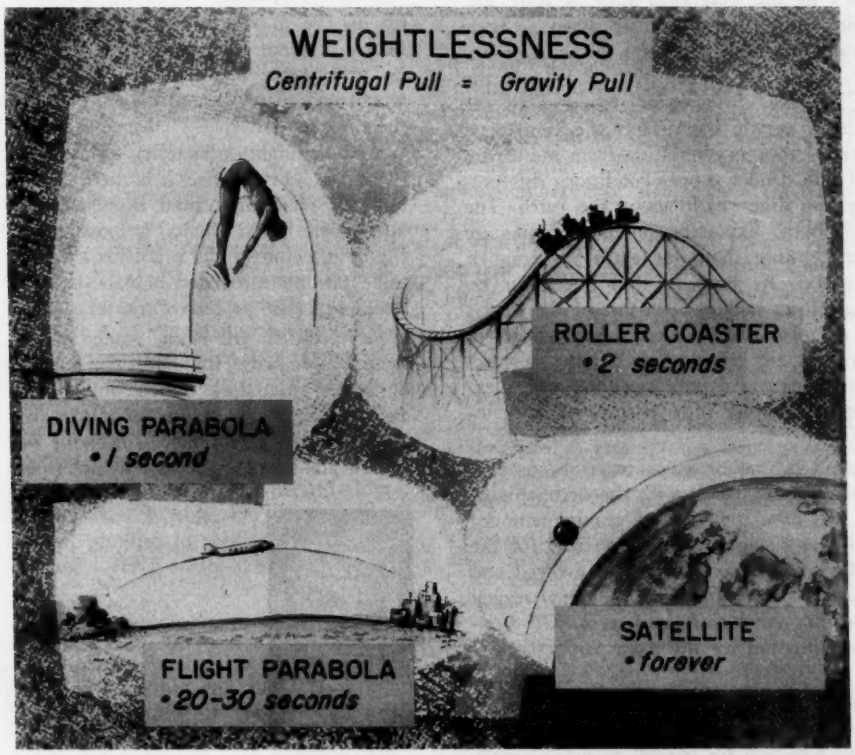

Fig. 1. At the top of a diving parabola a body experiences weightlessness (zero "G") for a period of fractions of a second. The "zoom" at the top of a roller coaster arc may produce weightlessness for a period up to .2 seconds. Flying a parabolic course at high speed may result in periods as long as 30 seconds. A satellite vehicle above the atmosphere remains weightless. [After Campbell, P. A.: Some Unsolved Problems of Aviation Otolaryngology, Ann. Oto., Rhin., & Laryng. 66:790-796 (Sept.) 1957.]

ORIENTATION

One of the first problems of weightlessness concerned the ability of the human operator to maintain his orientation.[4] Several earlier flights were made to investigate this problem. In the summer of 1951, Scott Crossfield flew about 30 parabolas in a YF-84 aircraft and reported a sensation of "befuddlement" on the first five trials. A more serious episode of disorientation during weightlessness was experienced by Col. Charles Yeager, who was the first man to fly faster than the speed of sound, and also to be weightless for more than 10 seconds. After 8 to 10 seconds he felt his head "grow thick," and the first disturbance of orientation began. In his thirteenth second of weightlessness he had the sensation that he was spinning slowly around in no particularly defined direction, and he then became disoriented spatially and had to pull out of the parabola. With returning weight, his badly needed sense of orientation was restored.

At about the same time, E. R. Ballinger of the Aeromedical Laboratory at Wright Field, Ohio, performed a series of experiments on weightlessness in a modified F-80E. His subjects, strapped firmly to their seats by a safety belt and shoulder harness, were able to maintain their orientation by visual reference. Head shaking had no adverse effect during weightlessness; however, the opinion was voiced that disorientation might have been extreme if the subjects had been unrestrained and blindfolded.[1] Dr. H. von Beckh, who experimented with turtles and human subjects in Argentina in a similar manner, reported the same results on orientation and visual control.[2]

In our own controlled experiments at the School of Aviation Medicine, the orientation ability of 47 individuals was studied in conjunction with their subjective reactions and performance capability during short periods of weightlessness. Through interviews and written reports after the flight, it was found that the response of the subjects was highly individualistic. The subject would experience the weightless state with his eyes open, looking at the instrument panel during one parabola and outside of the cockpit during another; he would close his eyes during a third one and experience weightlessness through insight. Thus, it was possible to obtain information relative to the state of orientation under visual and nonvisual conditions.[9]

Personal experience of disorientation ranges from strange feelings of motion such as floating and drifting, to a complete loss of reference. One subject having had 6 weeks of flying training and 14 jet hours in T-33's described his sensations as follows:

> DIVE 1: During pushover with hood closed and eyes open, slight but definite sensation of viscera being displaced upwards. No nausea, no disorientation with respect to cockpit environment . . . . No loss of motor coordination on attempted reaching for controls and instruments . . . .
>
> DIVE 2: Hood closed, eyes closed. Physical sensation identical with Dive 1. No sensation of disorientation or falling. Sensation of floating on air. No concept of orientation with respect to any external reference.
>
> DIVE 3: Hood open, eyes open. Sensations same as for Dives 1 and 2. No discomfort, no disorientation. Visual reference with ground provided no sense of illusion . . . . No sense of falling or loss of support except as visual orientation demonstrated position and direction of movement with respect to plane of earth surface . . . .

Another interesting episode was reported by a subject with more than 400 flying hours but no previous jet experience, who summarized his experience thus:

T-33 "ZERO-G" FLIGHT PATTERN

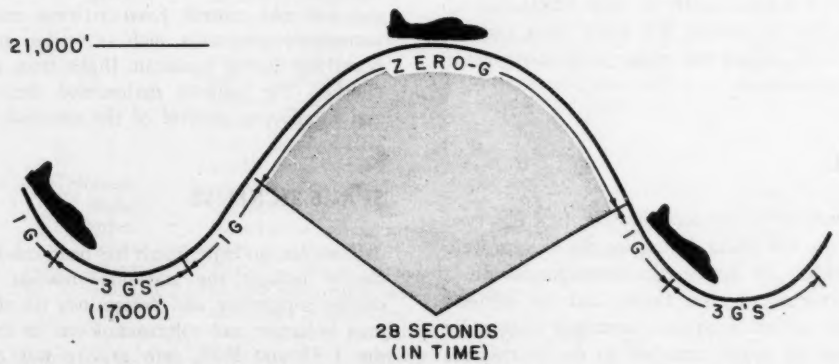

Fig. 2. Zero "G" flight profile produced by T-33 type jet aircraft. [After Stallings, H. D., Jr., and Gerathewohl, S. J.: Producing Weightless State, Flying, Nov., 1957, p. 34.]

The most remarkable sensation was one of having begun a "back-flip" and becoming suspended with the back horizontal, face upward. I have done a fair amount of tumbling on gymnastic teams in high school and college. The sensation in the flight was one of having started a "back-flip" from a standing position and then becoming "hung-up" part way over—looking toward the sky but not completing the flip. It was important to note that there was no continuous feeling of motion once this feeling of partial backward tumble reached the inverted position.

The flight was taken without a hood enclosing the cockpit so that visual references outside were available. However, I found myself ignoring the outside environment—not bothering to look for my orientation with reference to the ground.

Man's ability to orient himself depends upon a variety of factors. In conflict situations, such as during weightlessness, the eye becomes the only reliable organ. But will it remain reliable, or may it be deceived by illusions? There are definitely such occurrences in the weightless state; and one, the so-called oculoagravic illusion, was recently studied by Air Force scientists. A visual afterimage as well as a luminous target, observed in the dark, seem to move and to be displaced upward during weightlessness. If, on the other hand, the normal gravitational condition was restored or acceleration increased, the targets seemed to move subjectively downward. Of course, such illusory perceptions can cause confusion; and a certain degree of disorientation may be expected to recur when operating in such an unusual environment.[12]

Another attempt to study orientation during weightlessness has been made by immersing men in water. Since body and fluid have about the same specific gravity, the body, though being supported, is in a degree of weightlessness relative to the surrounding medium. The subjects exposed to this condition on an underwater tilt-table observed a rapid loss of position orientation after submersion. In general, large changes in tilt were necessary before they were noticed by the subject.[16] The results, which were obtained independently in Italy, Holloman Air Force Base, and Randolph Air Force Base, indicate that our otolith organs are rather insensitive instruments for orientation.

CONTROL

Disturbances of motor coordination, first observed by some of the test pilots during weightlessness, were also the subject of systematic investigation. In a series of experiments, von Beckh had his subjects place crosses in small squares arranged diagonally across a sheet of paper, attached to the instrument panel of his aircraft. The tests were made during subgravity dives, sometimes with the eyes open and sometimes with the eyes closed. His subjects encountered difficulties in drawing during the weightless state. When their eyes were closed, they lost their sense of control. After the third mark was placed, the line of crosses typically deviated 90 degrees upward.[2]

Systematic experiments involving a larger number of subjects were made at the School of Aviation Medicine during 1955-1956. They were designated to study eye-hand coordination during parabolic flight maneuvers in a T-33 aircraft. The test consisted of aiming at and hitting a target attached at arm's length to the panel in the rear part of the cockpit. By and large, the men struck too high in the subgravity state, due to the changed input-output ratio of the elevating arm muscles.[13] This finding was in accord with von Beckh's result; and it was later confirmed by Professor Lomonaco in Rome, Italy, who tested the tapping rate of individuals on a subgravity tower.[17] It is important to note that in all these tests, the subjects improved considerably in subsequent experiments through learning to compensate for the loss of weight, especially when the harness and safety belts were fitted tightly during the experiment.[2]

The experiments described clearly indicate that early experience of weightlessness is associated with a moderate degree of neuromuscular disturbance. They suggest that motor control is not seriously affected unless visual control is excluded, and that man can learn to interpret properly the new sensations of weightlessness and to control the altered mass-weight ratio of the body and its parts during the subgravity and zero gravity state. This is also evident through the performance of the pilots, who must fly the aircraft along an ideal parabola by compensating for slight deviations by immediate, smooth, and accurate control movements. Apparently, the fact that the central nervous system is presented with inconsistent stimuli from the vestibular apparatus (otoliths) in comparison with the visual and proprioceptive senses does not itself cause any serious disturbance of orientation and control. Even in some cases of severe autonomic symptoms, such as vertigo and vomiting, occurring during parabolic flight from one cause or another, the subjects maintained their orientation and intellectual control of the situation.

SPACE SICKNESS

Thus far, no experiment has been conducted which clearly isolates the stimulus-sensation relationship during subgravity and determines its effect on human behavior and tolerance. Even in the flights in the T-33 and F-94, zero gravity was obtained for several seconds only, subgravity accounting for the remainder of the parabola, with various types of ac-

celeration occurring during the experimental flight pattern. This must be kept in mind if we now wish to analyze the effects of weightlessness on the subjective experience and well-being of the individual.

To date, about 100 men have participated in our experiments at the School of Aviation Medicine. Of these, 47 were studied with regard to their tolerance to weightlessness and parabolic flight.[10] They all were cleared for jet flying and highly motivated for this venture. Seventeen were either Air Force pilots or at least had some flying training; only 9 had no jet experience prior to the experiment. All had flown more than once in conventional type aircraft.

When the possible consequences were first contemplated in 1950 by Gauer and Haber, and by Campbell, autonomic disturbances were anticipated through the conflict between sensations closely related to the autonomic nervous system. Briefly, they postulated that the brain receives its information on the position, direction, and motion of the body from four perceptual mechanisms: pressure on the nerve endings in the organs, muscle tone, posture, and the labyrinth of the ear, which indicate changes in position and acceleration through changes of the discharge rate of their nervous end organs. It was theorized that the first three of these mechanisms would cease to function properly in the weightless state, and that the otoliths might send signals to the brain which would serve to confuse the weightless man.[4, 8]

Subjective symptoms prior to our experiments consisted mostly of a moderate apprehension and mild tension or nervousness of the less experienced individuals. While the experienced jet flyers generally were free of symptoms, some of the neophytes showed signs of mild fear. Another portion of our subjects, consisting of volunteers prone to motion sickness, felt uncomfortable because they expected difficulties in flight. These symptoms frequently were followed by disturbances of the autonomic system during the parabolic flights.

Practically all of our subjects were highly motivated. This was true particularly for the few who participated despite their proneness to motion sickness. While about half of the entire group felt very comfortable and even reported feelings of exhilaration and pleasantness, about one-fourth reported no emotional involvement in the maneuver or a moderate degree of nausea, vertigo, and dizziness particularly during changing accelerations, rolls, and increased "G" forces. Less than one-third of the sub-

TABLE 1.—*How It Feels to Be Weightless.*
Responses of 47 Human Subjects to Short Periods of Virtual Weightlessness

Group	No. of Subjects	Attitude Prior to Flight	Psychological Reactions	Physiological Symptoms	Autonomic Disturbances
I	22	Normal, or slightly apprehensive	Sensation of rest or slow floating; feeling of well being, comfort, pleasure, relaxation, enjoyment and exhilaration; same experience during repeated exposure; euphoric and/or enthusiastic responses	Tingling and "light" sensation at abdomen; slight disorientation with eyes closed; slight giddiness; slight hyperventilation; slightly hyperactive patellar reflex	None
II	11	Normal, or slightly apprehensive	Sensation of floating or tumbling forward and backward; sensation of falling or lift during transition; sensation of standing on head, or being suspended in an inverted position; mildly elated situation, neither unduly pleasant nor exactly comfortable	Slightly disorientated with eyes open, enhanced with eyes closed; hyperventilation, mildly dizzy and slightly nauseated; hot or cold feeling, increased perspiration; tired and sleepy after flight	None, or moderate degree of vertigo and nausea attributed to changes of acceleration and weight
III	14	Normal, or slightly apprehensive; occasionally fear and acute anxiety	Sensation of floating, drifting and/or tumbling, sensation of falling forward or rolling over; "light" or "heavy" feeling in head or stomach; stomach seems to move upward; elated in the beginning with progressing discomfort	Generalized motion sickness syndrome including sweating, dry throat, increased salivation; feeling of coldness or heat	Vertigo and nausea; vomiting during flight

As stated in the text this analysis must be considered in the light of acceleration effects produced before true weightlessness was achieved in the parabola.

jects experienced discomfort, severe nausea, and motion sickness resulting in regurgitation during flight (table 1).

The question exists as to whether and to what extent the flight pattern on the one hand, and the attitude of the subjects on the other hand, contributed to the genesis of motion sickness during flight. There are indications that some of the symptoms were generated by motion itself or by the changes in motion, for we know that individuals differ markedly as to their motion sensitivity. The chain reaction of physiological events which leads to motion sickness is set off easily by changing accelerations which may occur to a higher or lesser degree in a train, car, boat, or aircraft. However, there is also evidence that, in some cases, the gastrointestinal complaints were produced by weightlessness alone. The individuals concerned reported "their stomach up in their throats" during the subgravity phase; and they felt definitely better when the normal state of gravity was restored or 1 "G" exceeded. However, the percentage of these "space sickness" prone individuals has not been determined as yet. Moreover, there is some evidence that apprehension, fear, and acute anxiety occurred concomitant with autonomic disturbances. Studies on human tolerance of weightlessness, relative to the benefit of training and repeated exposure, and on possible aid through medication will help to clarify the mysterious syndrome of "space sickness."

CARDIODYNAMICS

Next to the sensor and motor components of human behavior, the function of the large organs of the body might well be affected by changes of weight. The sudden loss of weight of the liver or the heart during transition from the normal state of gravity into weightlessness, or a prolonged exposure to this state during orbiting, for example, may adversely affect cardiac output, blood velocity, and venous return; and this, in turn, may alter the liver and heart as well as other functions. It is important to know whether or not the cardiovascular system can adapt itself to this situation; and, if so, its ability to adjust itself to the additional stress when the force of gravity returns.

Since the human body is semirigid and somewhat elastic in structure, the concept of stress and strain as used in the theory of elasticity can be applied to predict some of the physiologic effects of altered weight. Since weight can be a mechanical cause of stress, an increase may tend to induce strain while a decrease may reduce strain. We know that the organism is under a severe strain, for example, during the acceleration of a rocket, but that it is physically stress free in the appressionless state because no forces whatever act on the body. This may be the reason why most individuals feel elated during weightlessness.

However, these experiences do not permit conclusions as to the effects of longer periods of weightlessness. Let us consider the circulatory functions at first. They do not seem impaired when the direction of gravity is reversed, as for instance, during a headstand. This does not mean necessarily that the reversal of the gravity vector is more difficult to compensate for than lack of gravity. If the hydrostatic pressure in the veins decreases because of the lack of weight of their content, this organ system complex will be emptied faster into the heart than is the case in any position of the body under normal gravitational conditions. Fortunately, this difference is not great, and the individual can tolerate the transition from the standing to the lying position without circulatory disturbance. During this change of position, the hydrostatic difference in blood pressure drops below one-tenth of its original value; and there are no indications that the further reduction or loss of the remaining one-tenth may have any cardiovascular consequences. This is even more true, since the cardiodynamic blood pressure within the arteries in the horizontal position is more than 10 times higher than the remaining hydrostatic pressure differences of the cardiovascular system, which are caused by the different levels of the organs with respect to the heart.[7]

The situation may be different during weightless periods of long duration, say, during orbiting and space travel. After an exposure to weightlessness in the range of weeks or months, the tension within the cardiovascular system, and also of the large skeletal muscles, may gradually decrease with regard to the gravitational hydrostatic pressure differential. This may be similar to the generalized prostration and decrease of tonus and blood pressure after long confinement to the bed. Preliminary studies of the cardiovascular response of both man and animals to short periods of weightlessness have given no evidence of potential problem areas within this important organ system complex.

NUTRITION AND ELIMINATION

Every "care of flyer" concept of extra-atmospheric flight must provide for nutrition and elimination facilities under conditions of subgravity and zero gravity. They will become significant during prolonged flights of many hours or days in the not too distant future. Some authors already have considered theoretically the problems of eating and drinking in the weightless state; and an amusing example of the

difficulties involved was given in the Walt Disney film "Man in Space," where his weightless men attempted to sip the floating Martinis. But systematic studies of this intriguing problem were not started before 1957, when a total of 165 parabolas was utilized by personnel of the School of Aviation Medicine for observations on eating and drinking during weightlessness.[18]

With only 2 exceptions, all subjects experienced some difficulty in trying to drink from an open container. The liquids would simply float out of the glass when it was raised up to the lips; and it would hit the face with a splash, disperse upon contact, and then tend to slip into the respiratory tract or the sinuses at the whiff of a breath. When a squeeze bottle was used, however, the subject could drink without any difficulties, and it made no particular difference whether the liquid was sucked or squeezed into the mouth. Eating presented no difficulties either. Once liquids or food is in the mouth, chewing and swallowing is accomplished easily. From here on, the elastic forces of deglutition and peristalsis take over and transport the food through the body. But there was also a certain tendency to vomit or regurgitate easier during weightlessness than under normal gravitational conditions, which may contribute to the untoward gastrointestinal reactions described earlier in this paper. Furthermore, the elimination of the liquids and waste materials from the body may present a problem in the weightless state. For this reason, an experiment was conducted to investigate whether elimination of urine was possible during short periods of weightlessness.[19] Twenty-six subjects from the School of Aviation Medicine volunteered in one or more flights to study micturition. Two subjects became so ill early in the experiment that the mission had to be aborted prior to micturition. Ten subjects observed a decrease in urinary urgency during one or more of the parabolas, and 4 subjects noted slight to moderate loss of the sensation of urgency. On the other hand, 10 subjects were unable to detect any change in urgency or the act of urination. Four individuals reported that once micturition had been initiated, they were unable to detect the usual pressure clues indicating urination was continued.

The result of this experiment indicates that the majority of the test subjects were able to urinate in the subgravity state with little difficulty. Perhaps the most essential factor causing the variability in subjective awareness of urgency was the strangeness of the situation rather than a shift of sensory clues due to lack of weight of the content of the bladder. There is a good chance that most of the bodily functions of a "lower" order, such as digestion and elimination of food, may adapt themselves more readily to the weightless situation than the more complicated and sophisticated neurophysiological and psychological processes. At any rate, care must be taken that the elimination of the waste products of the body is accomplished with comfort and to the benefit of the crew.

CONCLUSION

As has been pointed out, such gravity-free studies are at present limited to periods measured in seconds. Each improvement in speed and performance spreads the ends of the parabola still further and thus increases experimental time in the weightless state. Most of those performing studies on weightlessness are of the opinion that the most serious effects, if there are any, probably will come after exposure in terms of hours, days, or weeks.

The advent of a gravity-free laboratory situation on earth which would allow studies of hours, days, or weeks would offer an opportunity for an immediate break-through in our knowledge, not only partially preparing the way for future space travel, but answering many questions in other disciplines of science and engineering. Many of the mysteries of nature could be unravelled, for instance, geotropism—the name applied to nature's tendencies toward alignment of plants, trees, and so forth, along the gravitational lines of force.[6] Possibly some human ailments are the result of the constant force of 1 "G" acting upon our bodies. Possibly aging is accelerated because we must always work and play under this by no means inconsiderable load. Research with new tools in new situations may give us new answers.

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◗ Colonel Campbell and Dr. Gerathewohl, Space Medicine Division, School of Aviation Medicine, Randolph Air Force Base.

Historical Review: Characteristics Of a Successful Pilot

BERNARD E. FLAHERTY, LT. COL., USAF(MC)FS, and DAVID K. TRITES, Ph.D., USAF

Randolph Air Force Base, Texas

IN THE EARLY DAYS of the Army Air Corps, according to Burwell,[1] the medical service found it necessary to combat rumors about the Air Corps in general and the physical examination in particular.

Many of the public believed that the much discussed medical examination of the aviator was a refined form of torture. One such story concerned itself with the "needle test," in which the blind-folded applicant held a needle between his thumb and forefinger and a pistol was fired unexpectedly behind him. The examiner would then note whether the applicant, because of his supposed lack of nerve, had pushed the needle through his finger. Another much-rumored test consisted, supposedly, of hitting the applicant over the head with a mallet, when he least expected it. If he regained consciousness within 15 seconds, he was assumed to be qualified as being of the stuff of which aviators were made.

Since this earlier period we have made considerable advances in the field of selection—in the recognition of characteristics that tend toward success or failure in a flying career.

However, isolation of the characteristics of successful men in any occupation requires two types of assessments of individuals. First, it is necessary to define and measure their personal characteristics, and second, it is necessary to array them on some continuum of success. Neither of these assessments is easy to carry out. In many cases the instruments for measuring personal characteristics are crude or nonexistent; in other instances, it is difficult to define what is meant by success.

Fortunately, there have been a number of studies of aircraft pilots, using different instruments for measuring personal characteristics and different definitions of success, which have converged to produce a relatively clear picture of the successful pilot. These investigations together with insights born out of the vast experience of flight surgeons and psychiatrists who have worked intensively with pilots, in their selection and medical management in peacetime and in combat, will be summarized in this report.

Before proceeding, it should be pointed out that the characteristics of pilots may be divided conveniently into three broad areas: physical, aptitude or skill, and psychiatric or adaptability. Of these three areas, we shall concern ourselves primarily with the last, since meeting the physical requirements and having adequate aptitude or skill may be considered as prerequisites for becoming a pilot; we are primarily interested in assessing the adaptability of those men who are pilots.

One of the earliest comments on the characteristics of successful pilots was made by Dockeray[8] describing research during World War I. In summarizing Dockeray's comments, Burwell[1] has stated,

> As to the personality of the aviator, Captain Dockeray noted that quiet, methodical men were among the best fliers. The one quality which seemed most needed was intelligence: the power of quick adjustment to a new situation and good judgment.

The criterion of success in this case was not specified, but seems to rest upon Captain Dockeray's

Lt. Col. Bernard E. Flaherty is chief of the Department of Neuropsychiatry of the School of Aviation Medicine.

The characteristics of a good pilot, according to various studies, are an easy going sociability, a practical intelligence, coolness and steadiness, seriousness and conscientiousness, leadership and responsibility, combat aggressiveness, skill and interest in flying, and teamwork.

personal observations. How accurate these were may be judged by later studies.

The main development between World War I and II was the addition of a comprehensive personality evaluation to the Army Air Force's physical examination for flying. This part of the physical examination, called the Adaptability Rating for Military Aeronautics (ARMA), was predicated upon the assumption that a potentially good pilot should be intelligent, mature, emotionally stable, and not be liable to breakdown under the stress of flying.

Over a period of years of neuropsychiatric evaluation of applicants for flying duties, certain additional areas of personality and historical background became recognized as of basic importance. Unfortunately, because of the small number of men entering pilot training between 1919 and 1939, little direct evidence to support the assumptions underlying the ARMA was produced during that period. With the advent of World War II, the number of men entering flying training increased tremendously and it became possible to study intensively the characteristics of successful pilots. Several studies made during that war deserve special attention.

In the first of these, Rafferty and Deemer,[5] through statistical treatment of ARMA interviews, derived a table of 31 items. Grouped as a checklist by Mebane,[4] these items were rearranged in a logical fashion for an interview. The interviewer could then check the various items as favorable or of no significance insofar as the applicant's adaptability was concerned. These items are contained in table 1.

Additional evidence for the usefulness of these categories evolved from an investigation reported by Jenkins[3] and his associates of more than 4,000 Navy combat pilots in combat zones. In this study, the following word pictures of the good and poor pilot, based upon information obtained from their associates, were developed.

In general, the description of the good combat pilot, as indicated by the characteristics judged most important, might be phrased:

> An alert man, a real leader, who feels responsible for the safety of all personnel flying in combat with him, and who is steady and reliable in the air.

In general, the description of the poor or "not wanted" combat pilot might be phrased as follows:

> A man, erratic and undependable in the air, who flies "with his head in the cockpit" and frequently "dopes off," who has no sense of teamwork, and who may be too worried about his own safety, or may deliberately take foolish risks, unnecessarily endangering the lives of others.

An emphasis on alertness, teamwork, emotional and social adequacy, and motivation for combat flying, as important characteristics of combat pilots, is clearly indicated.

In addition, the study identified the dimensions given in table 2 which differentiate the "good" combat pilot from the "poor" combat pilot.

In another study Roff[6] investigated combat leadership in the Air Force. This study made use of ratings collected from more than 500 pilots upon their return to the United States in 1945 from combat zones. As described in that report,

> . . . the best leader was characterized by superior quality and speed of combat decisions, less concern with personal advantage, better flying judgment, showed greater responsibility for his men in combat; had greater personal acceptability, sincerity, and courage, shouldered responsibility more easily and was more impartial.

TABLE 1.—*Checklist for Applicant's Adaptability as a Pilot.*

1. Introductory Remarks and Explanations.
2. Review of Standard Forms 88 and 89.

+	—	0	3. The ARMA Interview
			Flying interest or experience
			Tolerance of flying, hazards, and deprivations
			Previous military experience
			Past history:
			Nationality
			Early environment
			Economic status
			General family history
			Personal medical history
			Childhood personality traits
			Accidents and injuries
			Ability to recall
			School
			Achievements
			Employment
			Present considerations:
			Social outlets
			Sports
			Artistic interests
			Habits (tobacco, alcohol, drugs, gambling)
			Personal hygiene
			Marital matters
			Sexual problems
			Religion
			Conflicts and reactions
			Moods
			Feelings of fear, anger, aggression
			Disciplinary trouble
			Philosophy of life
			Personal and family goals
			Self-evaluation
			Emotional reactivity
			Flow of thought
			Tact
			Poise
			Physical habitus
			Appearance

SUMMARY:
Pass. . . . . .
Fail. . . . . .
Further Study. . . . . .

After Mebane, J. C.: Manual of Neuropsychiatry for Flight Surgeon, School of Aviation Medicine, USAF, Randolph Air Force Base (Sept.) 1956, p. 123.

It also was found that the items in the rating scale used in the study could be considered to measure six basic variables. These were described in terms of the good leader as: competence in combat flying, fairness, courage, administrative competence, responsibility, and likeability.

It must be pointed out that in describing the characteristics of the successful pilot, an ideal prototype has been created. Actually some pilots who are extremely successful might, by some standards, be considered as evidencing current gross psychopathology. However, such men have been found to be in the minority, and our picture of the desirable pilot remains unchanged.

TABLE 2.—*Characteristics of Good and Poor Combat Pilots.*

Good Pilot	Poor Pilot
Easy-going sociability	Temperamental unsociability
Practical intelligence	Lack of practical intelligence
Coolness, steadiness	Excitability, lack of coolheadedness
Seriousness, conscientiousness	Failure to take job seriously
Leadership and responsibility	Reaction to failure by mental mechanisms
Combat aggressiveness	Fear syndrome
Skill and interest in flying	Lack of job skill
Teamwork	Foolhardy individualism

Multiple stigmas also may be evident in a potential flyer's past history. If he is able to recall these without conflict and appears to have matured emotionally despite or because of them, he frequently possesses an additional strength toward a successful flying career. At this point we should note Hastings, Wright, and Glueck's survey of 150 successful heavy bombardment flyers in World War II.[2] Many of these highly successful crewmen admitted deleting stigmatizing past histories when first interviewed by medical officers—fearful that these data would preclude their chance to fly. They subsequently described family histories which included quantitatively significant degrees of marked emotional instability, psychosis, alcoholism, divorce, and such. Also as many as 57 per cent of these crewmen, established as highly successful in a combat situation, admitted on retrospect having experienced reaction patterns in their personal histories which would normally expect to predispose them to emotional instability. However, they concluded that

> . . . extraversion with great energy and stability was the optimal combination for success. The most essential ingredient was not the pattern followed, the stability, the persistence nor the direction, but the energy with which the business of living is conducted.

They noted further that their successful crewmen were "unusually vigorous, aggressive, persistent and healthy in body."

Following World War II a unique opportunity was presented to the Air Force for on-the-spot studies of personnel in combat during the Korean "police action." The files of the School of Aviation Medicine contained a large amount of data, collected during training, on a group of pilots who saw combat after the information had been collected. It was possible to follow some of these men into the combat zone and collect information concerning their adjustment to combat. As a result of two studies the following conclusions were reached:[7]

> As presently measured, the successful pilot tends to be generally well-adjusted, relatively free from symptoms of illness, adept at social interactions, not unduly concerned with self-advancement, has good flying ability, is easily trained, and seems to be a more competent flyer.

In summary all of these investigations have converged to give a picture of the successful military pilot as a man who is healthy, well adjusted, well liked, vigorous, courageous, responsible, motivated toward his career, and a skillful operator of an aircraft. With respect to any anonymous definition of flying as "hours and hours of monotony, interspersed by occasional periods of sheer panic," the flyer must cope effectively with these "occasional periods of sheer panic" without an accumulation of "functional" or "somatic" symptoms. He is able to accept his relatively passive role in relationship to the powerful flying mechanism, vicissitudes of the weather, and his dependence on auxiliary personnel, both in the air and on the ground, yet retain the capacity to act with consistent economy and efficiency in the presence of great stress and hazard.

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♦ Lt. Col. Flaherty and Dr. Trites, United States Air Force, Randolph Air Force Base, Texas.

Peripheral Arterial Embolism

**JESSE E. THOMPSON, M.D.;
DALE J. AUSTIN, M.D.; and
VERNOR LOVETT, M.D.**

Dallas, Texas

ONE OF THE MOST common causes of acute arterial occlusion of the extremities is arterial embolism. This is a serious disorder, for it usually reflects an underlying cardiac disease which in itself carries a substantial mortality. Furthermore, if untreated, it leads to gangrene and amputation in a high percentage of cases. In few other diseases is prompt diagnosis and treatment so directly related to the final outcome as in arterial embolism.

It is the purpose of this paper to present our experiences with 42 patients having peripheral arterial embolism and to point out the features in management of this disease which are most helpful in saving life and limb.

PROGNOSIS

The over-all prognosis of patients with arterial embolism is poor. Table 1 shows the mortality in several representative series taken from literature.[2, 4, 8, 9] Of the 42 patients reported in the present series, 10 died in the hospital, a mortality of 23.8 per cent. Among 28 patients undergoing embolectomy, 4 deaths occurred, a mortality of 14.3 per cent, while in 16 patients treated without operation, 6 died, a mortality of 37.5 per cent.* Of the 10 patients who died in the hospital, 6 died of cardiac causes, 3 of cerebrovascular accidents, and 1 of pulmonary embolism.

The usual source of peripheral arterial emboli is the heart. In this series 38 patients had obvious cardiac disease. One patient had a myocardial infarction as the most likely source although actual proof could not be obtained. A proximal aortic aneurysm treated by aneurysmectomy and grafting was the source of emboli in 2 patients, and in 1 patient the source was entirely obscure. The most common cardiac diagnosis was auricular fibrillation, which was present in 16 patients. Following closely was myocardial infarction, which was the diagnosis in 14 patients.

*There were 2 patients each having 2 emboli, both having been treated by surgery on one occasion and without surgery on another occasion, thus accounting for the apparent discrepancy in the total number of patients.

TABLE 1.—*Mortality Associated with Arterial Embolism.*

Author	Year	No. of Patients	Mortality %
Haimovici	1950	154	49.3
Des Prez & Hubay	1953	85	34.1
Warren, Linton & Scannell	1954	200	30.6
Shumacker & Jacobson	1957	55	20.0
Thompson, Austin, & Lovett	1958	42	23.8

Emboli originate as clots from the fibrillating auricle or as mural thrombi in the cardiac chamber over the site of damaged myocardium. The remaining cardiac diagnoses included arteriosclerotic heart disease, congenital heart disease, rheumatic heart disease, contusion of the heart, and subacute bacterial endocarditis. It is of interest to note that arterial embolism occasionally may be the first sign of a myocardial infarction or other cardiac disease. These silent infarcts are diagnosed by electrocardiography after embolism has occurred. In arterial embolism with no obvious source for the embolus, cardiac studies are mandatory. There were 3 such emboli originating from silent cardiac disease in this series.

A total of 47 embolic episodes occurred in the 42 patients. The sites of lodgement were distributed as follows: 3 aortic, 7 iliac, 15 femoral, 10 popliteal, 3 tibial, 5 axillary, 3 brachial, and 1 radial. As is usually the case the femoral artery was the most common site for embolism, constituting about one-third of the total. These emboli characteristically lodge at bifurcations of the major arteries, where the lumen of the vessel narrows abruptly. The site, therefore, is dependent largely on the size of the clot passing out of the heart. Recurrent or multiple embolism in the same patient is a frequent phenomenon, especially in patients with auricular fibrillation.

Dr. Jesse E. Thompson and his co-authors are on the staff of the Department of Surgery at Baylor University Hospital in Dallas.

A series of 47 peripheral arterial emboli occurring in 42 patients is presented. Among patients undergoing embolectomy the mortality was 14.3 per cent, while in the non-operated group the mortality was 37.5 per cent. Ideal overall therapy consists of restoration of main vessel blood flow by embolectomy; prevention of thrombosis by anticoagulants, especially heparin; and release of vasospasm by sympathetic blocks and vasodilator drugs.

PATHOPHYSIOLOGY

There are three basic factors which must be considered in the pathophysiology of arterial embolism since proper comprehensive management of the disease is founded on these considerations. When embolism occurs, there is a sudden acute *interruption* of main vessel blood flow. This is the single most important factor, not only because of the marked decrease in arterial flow to the distal tissues, but also because of the train of events which this occurrence provokes. The second factor is the immediate and profound *vasospasm* which takes place in the main vessel proximal and distal to the block and in the collateral vessels supplying blood around the site of the occlusion. This reduction in blood flow due to vasospasm in the collateral vessels may be the factor which determines viability of the limb. The third factor is a consequence of the first two; *thrombosis* of the distal and collateral vessels occurs if occlusion and vasospasm go unrelieved for a long enough period of time. If such thrombosis occurs, even the restoration of main vessel flow may not restore the viability of a limb, because of the absence of sufficient runoff channels to supply blood to the tissues. If these factors continue to operate unabated, the distal extremity will become gangrenous.

It is clear, therefore, what the basic measures of treatment should be. Most important is the restoration of main vessel blood flow which can be accomplished by removal of the offending clot. The release of vasospasm can be brought about by vasodilator drugs and sympathetic blocks. For preventing thrombosis in the distal and collateral vasculature, anticoagulants assume a major role in treatment of arterial embolism. Ideally, all of these provoking factors should be counteracted for best results, but as will be discussed later, removal of the obstructing clot may not be possible or feasible in certain cases.

CLINICAL FEATURES

In the usual case peripheral embolism is recognized easily by the sudden onset of pain in the extremity, followed by coldness, pallor, numbness, and varying degrees of paralysis. Examination reveals absent pulses distal to the site of lodgement. At times, however, the onset may be slow rather than sudden, and differentiation from arterial thrombosis may be difficult. Occasionally the onset of acute deep thrombophlebitis is accompanied by such a degree of vasospasm that the diagnosis of arterial embolism is entertained. The presence of auricular fibrillation, the history of a recent myocardial infarction, or the presence of other cardiac disease all weigh in favor of embolism, as does the absence of peripheral arteriosclerotic disease elsewhere. At times the exact site of lodgement is difficult to ascertain with certainty although the clots characteristically lodge at bifurcations. Careful palpation of pulses usually is adequate to locate the embolus, but occasionally arteriography is necessary and may be helpful. The oscillometer finds usefulness in pointing out the level of decreased or absent oscillations and, hence, may aid in localization. In case of doubt and where no contraindication exists, prompt exploration of the artery becomes necessary and one may be rewarded by finding an easily removable embolus.

TREATMENT

Treatment of peripheral embolism is based on a consideration of the pathophysiologic factors, the time interval involved, the location of the emboli, the general condition of the patient, and the state of viability of the limb when first seen. In neglected cases where the limb is gangrenous, nothing short of amputation is of benefit. Many times the general condition of the patient is so poor because of his underlying disease that operative treatment is contraindicated. In the past some authors have advocated nonoperative management of emboli as the principal mode of treatment or have relegated surgical treatment to a last resort role if medical measures prove inadequate. Increasing experience, however, has shown that better immediate as well as long term results are obtained when surgical embolectomy is employed on the larger arteries, for example, the aorta, iliac, femoral, popliteal, axillary, and brachial. Surgical treatment is not usually considered for emboli to the smaller arteries, such as the tibial, peroneal, radial, and ulnar. We, therefore, have considered embolectomy our primary method of treatment in the majority of cases. Once the diagnosis of embolism is made, treatment should be instituted promptly, whatever its form. The best results are obtained in those patients treated without delay.

For release of vasospasm, a sympathetic block with novocain or other agent may be carried out, or spinal anesthesia may be administered if operation is to be done using this type of anesthesia. These measures should be done immediately and before anticoagulants are given. Vasodilator drugs such as Priscoline, Ilidar, or papaverine also may be given.

If surgery is decided upon, embolectomy should be carried out promptly. General or spinal anesthesia

must be employed for aortic,[5] iliac, and popliteal embolectomy, and for certain axillary ones. Local anesthesia is used for femoral and brachial embolectomy. After distal and proximal control are obtained, the artery is opened, the embolus is removed, and any clot in the distal artery is sucked out or massaged back. The artery also is flushed from above. When good retrograde flow is obtained and adequate flushing has been done, heparin is instilled into the distal vasculature and the arteriotomy wound is sutured with 4-0 or 5-0 arterial silk.

Postoperatively heparin is given to prevent thrombosis, the average dose being 75 mg. of aqueous sodium heparin every 8 hours or 50 mg. every 6 hours intramuscularly. Vasodilators also are employed, but sympathetic blocks are not done while the patient is heparinized because of the risk of hemorrhage. Certain general measures also are employed. No external heat is applied to the limb. The application of heat is a frequent error and at times is catastrophic. Heat increases the metabolic needs of the tissues and in the presence of decreased blood supply to a limb may be responsible for precipitation of gangrene. Cold is contraindicated because it induces vasospasm. The limb should be left at room temperature under a cradle. The position of the limb also is important. It should never be elevated, but should be kept flat or at a level several inches below the heart since the effects of gravity are considerable in a limb with precarious circulation.

Certain patients with embolism are best treated by nonsurgical measures. These include patients having emboli to the smaller vessels such as tibial, peroneal, radial, and ulnar; poor risk patients with popliteal or upper extremity emboli in whom anesthesia would present a serious threat to life, where the limb is obviously viable; moribund patients regardless of the state of viability of the limb; and patients with an obviously gangrenous extremity where amputation is the only treatment possible. Under these circumstances the general measures mentioned previously are applied vigorously. Of all the nonsurgical measures available, in our opinion, heparin is by far the most useful and important item, for if thrombosis can be prevented, the limb has its best chance of survival. In fact, if circumstances are such that embolectomy is indicated but must be delayed because of the problem of transportation to a medical center or other reason, heparin should be given immediately. Embolectomy may then be carried out some hours later with success because of the prevention of thrombosis of the distal and collateral vasculature. Patients with auricular fibrillation, who frequently are subject to recurrent bouts of peripheral embolism, may, as a preventive measure, be placed on long term oral anticoagulants when heparin is discontinued.

RESULTS

There were 42 patients in this series, sustaining a total of 47 embolic episodes. These were 22 males and 20 females. The ages ranged from 18 to 99 years, with an average age of 58 years. The mortality among these patients has been given previously. The results of treatment in the surviving patients are shown in table 2.

TABLE 2.—*Limb Survival in Living Patients.*

	Cases	Amputations	
		No.	%
Embolectomy	24	3	12.5
No operation	10	1	10.0
Total	34	4	11.8

Among 24 patients undergoing embolectomy, 3 legs had to be amputated for gangrene. All 3 were the result of femoral emboli which occurred 10 hours, 36 hours, and 4 days before they were seen. Among the successful embolectomies were 2 aortic, 3 iliac, 9 femoral, 3 popliteal, 3 axillary, and 1 brachial. Of interest is 1 female patient, aged 99 years, who had a femoral embolus successfully removed under local anesthesia. She has since celebrated her hundredth birthday.

In 10 patients treated without surgery, one 63 year old man lost his leg. This was the result of a popliteal embolus which had occurred 7 days before we saw the patient. Included in this group are patients with small vessel emboli, upper extremity emboli, and poor risk patients with obviously viable limbs. No upper extremity was lost in either the operated or nonoperated groups. The over-all incidence of amputation in the 34 surviving patients was 11.8 per cent, which compares quite favorably with the results in the literature.[6]

Many factors contribute to the loss or survival of a limb following acute interruption of its blood flow by an embolus. One of the most important factors is the time interval between onset and institution of treatment. The shorter the time involved, the less chance of irreversible thrombosis occurring. In an analysis of the results in our series it was found that among those patients whose treatment was started within 13 hours of onset of the disease, 81.5 per cent survived with their limbs intact, while 18.5 per cent died or lost a limb. Of those patients coming in for treatment after 13 hours, only 47 per cent survived with limbs intact, while 53 per cent died or lost a limb. Regardless of the method of treatment employed, it should be begun without delay once the diagnosis is made or suspected.

RECENT INNOVATIONS

In recent years several innovations and techniques have been advocated in the treatment of arterial embolism in an effort to improve both the immediate and the long term results.[3, 7]

One of these is "late embolectomy," or embolectomy performed later than approximately 12 hours after occurrence of the embolus. It generally has been thought that patients seen after such long periods of time are not improved sufficiently by surgery to warrant its use, and they have had medical measures carried out instead. It is obvious from the foregoing discussion that many such patients lose their limbs. In an effort to salvage some of these, late embolectomy has been advocated. If the limb obviously is viable, the procedure is not necessary; if it obviously is gangrenous, the procedure is not worth while. In the borderline cases when ischemia is present without gangrene, as noted by pain, color changes, and evidence of poor collateral circulation, such a procedure may save the limb. This is particularly true in those patients who may already be on anticoagulant therapy for other reasons or who were started on anticoagulant therapy when embolization occurred.

One of the patients in this series was put on heparin immediately after an iliac embolus occurred. Four days later, after transfer to our hospital, a successful embolectomy was carried out with restoration of pulses in the leg and complete relief of symptoms. Another patient, receiving anticoagulants because of coronary artery disease and myocardial infarction, had an embolus into the orifice of a femoral artery graft. He was so ill that it was felt unwise to transfer him to our hospital for surgery. Anticoagulants were continued, and 22 days later the embolus was removed and liquid blood clot aspirated from the graft. At the time of surgery the limb was in a pregangrenous state. Following embolectomy, pain and function were improved markedly and the limb was saved. At times late embolectomy may be combined with an artery grafting procedure to save what otherwise might be a hopeless situation, provided, of course, the distal vasculature is patent.

Another innovation is the retrograde flush procedure.[1] At times it is possible to remove an obstructing embolus only to find the distal vasculature occluded with clot. The distal artery may then be exposed at the popliteal area or at the ankle and the clots which cannot be extracted from above are flushed out from below using saline solution under pressure. Late embolectomy and retrograde flush may be combined handily and be responsible for saving limbs. In our series 1 patient with popliteal embolism seen 21 hours after onset was treated successfully by embolectomy and retrograde flush.

We also have adopted a more aggressive approach toward upper extremity and popliteal emboli, believing that embolectomy in many of these will improve limb salvage and give better functional results. A small but definite percentage of amputations follows upper extremity embolization.[8] If the embolus is in the axillary or brachial artery and there is no contraindication to surgery, we believe it should be removed. We have seen functional impairment of upper extremities as a late result of emboli treated conservatively even though the limb was not lost. Critical clinical judgment must be applied in the selection of these patients for surgery, however. A similar, but more impressive line of reasoning applies to popliteal emboli where the incidence of gangrene in the nonsurgically treated group may be 20 to 30 per cent.[9]

Unfortunately, popliteal embolectomy is a more difficult procedure than, for example, femoral embolectomy. The latter is simply done under local anesthesia with the patient in the supine position. For popliteal embolectomy the patient must be in the lateral or prone position, and this may be intolerable for sick cardiac patients. Operation is difficult under local anesthesia because of the extensive dissection required, and it is usually done under general or spinal anesthesia. Here again surgery may be contraindicated because of a poor risk patient. It is wiser to risk the loss of a limb than the loss of a patient. If the general situation is adequate, however, we believe popliteal embolectomy should be carried out.

OUTLINE OF MANAGEMENT

A summary of suggestions regarding the treatment of arterial emboli which will give the most hopeful outlook as regards life and limb follows:

1. Do not delay. Once the diagnosis of embolism is made, treatment should be instituted promptly. The best results are obtained in those patients treated early, especially within 10 to 12 hours.

2. Do not elevate the limb. Keep the limb flat in bed or a few inches below the level of the heart.

3. Do not apply heat to the limb. Keep it at room temperature.

4. Embolectomy should be carried out promptly when indicated.

5. Anticoagulants are very important. If surgery must be delayed or is contraindicated, the prompt administration of heparin is the best measure available to prevent a catastrophe.

6. Sympathetic blocks and vasodilator drugs are useful for the relief of vasospasm.

SUMMARY AND CONCLUSIONS

A series of 47 peripheral arterial emboli occurring in 42 patients is presented. Ten patients died in the hospital, giving an over-all mortality rate of 23.8 per cent. Among patients undergoing embolectomy the mortality was 14.3 per cent, while in the non-operated group the mortality was 37.5 per cent.

The heart was the source of emboli in 39 patients, a proximal aortic aneurysm the source in 2 patients, and the source was obscure in 1 patient. There were 3 aortic, 7 iliac, 15 femoral, 10 popliteal, 3 tibial, 5 axillary, 3 brachial, and 1 radial emboli.

Ideal over-all therapy consists of restoration of main vessel blood flow by embolectomy; prevention of thrombosis by anticoagulants, especially heparin; and release of vasospasm by sympathetic blocks and vasodilator drugs.

In the operated group, 3 legs were amputated, an incidence of 12.5 per cent, all due to femoral emboli. In the nonoperated group 1 leg was lost, an incidence of 10 per cent, this due to a week old popliteal embolus. No upper extremity was lost. Best results are obtained in patients treated within the first few hours after embolization occurs.

The recent innovations of late embolectomy, retrograde flush, and artery grafting may improve immediate and long term results.

Practical suggestions regarding therapy are listed in detail.

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Drs. Thompson and Austin, 1008 N. Washington, Dallas.

Dr. Lovett, Department of Surgery, Baylor University Hospital, Dallas.

Treatment of Acne Vulgaris With Tetracycline

A 4 Year Study

M. ALLEN FORBES, JR., M.D., and WILLIAM C. KING, M.D.

Austin, Texas

SINCE ANDREWS and others[1] reported in 1950 the use of antibiotics in the treatment of acne vulgaris, there have been many reports[2-4, 6, 7, 10, 11] by different investigators on the value of antibiotics in the treatment of this condition. We first used oxytetracycline in 1952 and were pleased with its effect on the pustular element of this disorder.

We began a study on the use of tetracycline in 1954 and have given previous reports[6, 7] on its use in the treatment of acne vulgaris. As far as control of the pustular element was concerned, our results were very encouraging. These studies, however, covered a period of only 18 months with an average follow-up of 4.5 months.

Sensitivity tests were not routinely performed, previous studies[2] having shown them not to be generally helpful in the selection of a proper antibiotic for the management of pustular acne. But if after 1 to 2 weeks of therapy with tetracycline there was no response, we performed sensitivity tests, some of which proved to be of value. All patients on whom tetracycline was used in this study also received conventional acne therapy to control excessive oiliness and the development of comedomes. In addition to cryotherapy, these patients were instructed to use soap and water cleansing two to three times daily and were given drying lotions to apply nightly. At the completion of our original studies[6, 7] several questions still remained unanswered, and we decided that by continuing the study for 4 to 5 years most of these problems could be resolved. The following questions, which we have attempted to answer here, are the reasons for this 4 year study:

1. Would a minimal maintenance dose of tetracycline given over a long period of time lose its effectiveness?

The tetracycline employed in this study was kindly supplied by the Upjohn Company, Kalamazoo, Mich., whose trade name for tetracycline is Panmycin.

2. What, if any, side effects would develop after prolonged dosage?

3. Would intermittent small doses be adequate for control of the condition or would continuous therapy be necessary?

4. If the effect was due to direct action on the bacteria, would the bacteria become resistant to tetracycline?

5. What size dose would be safe and effective over a period of years rather than months?

RESULTS OF STUDY

We have used tetracycline hydrochloride and tetracycline phosphate over the past 4 years in 567 cases of pustular acne. Of this number, we are including 485 which have been followed long enough to warrant reporting. Some of the 72 not reported had good initial response but were lost from observation. The ages varied from 10 to 40 years, but well over 95 per cent were between the ages of 15 and 22. Since it has been previously shown[4, 6, 7, 10] that this antibiotic does not cure pustular acne, we decided to use the terms *controlled* or *failure* in reporting our results. If the patients were poorly controlled, they were classified as failures.

Ninety-five cases of the 485 reported have been observed and have been under treatment for 2 to 4 years. Of these 95 patients there were 5 who were considered failures, even though they were given 1,000 mg. daily for varying periods of time. In spite of repeated courses, the pustular element in these 5 patients did not subside. Of the remaining 90 patients, after an initial dose of from 500 to 1,000 mg. was administered daily for 1 to 6 months, many were controlled on 100 mg. daily, and some on 100 mg. every other day. There were others who remained clear for weeks or months and then developed a recurrence of pustules. These again were controlled completely by 100 to 500 mg. daily for a few days to 1 month. We did not notice any decrease in the effectiveness of the drug, even in those patients who had been on medication intermittently for 4 years. The pustular recurrences usually were not so severe as the original condition. Forty-two patients were maintained on as little as 100 to 125 mg. daily. Forty-five of the remaining 48 were maintained on 200 to 300 mg. daily, and 3 others required 500 mg. daily. Occasionally we found that the dosage had to be increased temporarily, but these were the lowest maintenance doses effective during pustular recurrences. No side effects were observed, and the blood counts done on 40 patients were within normal limits.

The next group of 91 patients was on this medication for 1 to 2 years. Of this group, 2 patients developed a gastrointestinal upset after being on the antibiotic intermittently for more than 1 year. Counting these 2, since tetracycline had to be discontinued, we had a total of 4 patients who did not respond. Of the 91 patients, 33 were maintained on 100 to 125 mg., and 51 required 200 to 300 mg. daily. The remaining 3 required 500 mg. daily.

In those who had been on the medication for 1 to 11 months (with an average of 6 months) there were 7 failures. This number included 2 patients who had gastrointestinal upsets, and 1 who had a monilial vaginitis.

Dr. M. Allen Forbes, Jr. and his co-author submit this paper from the Department of Dermatology and Syphilology, Dr. J. Fred Mullins, director, University of Texas Medical Branch, Galveston. It was presented for the Section on Dermatology of the American Medical Association in San Francisco, June 26, 1958.

Tetracycline hydrochloride and tetracycline phosphate were used in 567 cases of pustular acne, of which 485 were followed from 6 months to 4 years and are reported here. Both preparations control the pustular element of acne vulgaris in the majority of cases without serious side effects and without losing their beneficial effect.

INTERPRETATION OF RESULTS

From the results obtained in this study the following facts seem to be established:

1. Tetracycline does not lose its effectiveness when given over a long period of time.

2. Since most of the side effects requiring discontinuance of the medication occurred among patients who had been on antibiotics less than 2 years, prolonged medication appears not to increase side effects.

3. Intermittent therapy was sufficient for control. In many cases recurrences would develop several weeks to several months following the cessation of therapy.

4. If, as many workers believe, the effect of tetracycline is due to suppressive action on the bacteria, then the organisms apparently do not develop resistance, as the majority of patients were controlled on much smaller doses than were given initially.

5. The results indicate that the large majority of cases, after an original dose of 1,000 mg. per day for several weeks or months, can be maintained on intermittent courses of 100 to 300 mg. daily.

6. The control exerted by tetracycline on pustular lesions substantially reduces post-acne scarring.

DISCUSSION

The exact mechanism of the beneficial effect of the antibiotics in the control of pustular acne is not thoroughly understood. Loveman and others[8, 9] have shown that the intestinal bacterial flora in patients with and without acne does not differ and also that the bacterial flora was altered when the patients were on antibiotics. Stritzler,[5] however, observed that the intestinal flora is rapidly reestablished in spite of continuing antibiotic therapy. He also reported that following the oral administration of neomycin, intestinal bacterial flora was drastically reduced, but that there was no beneficial effect on the acne lesions. We believe, as do Baer and Witten,[5] that there is some unknown factor in the antibiotics which is partially responsible for their beneficial effect in acne.

CONCLUSIONS

Tetracycline controls the pustular element of acne vulgaris in the majority of cases.

There is no difference in the effect of tetracycline hydrochloride and tetracycline phosphate.

These antibiotics may be given over a period of several years without serious side effects and without losing their beneficial effect.

The effective maintenance dose is lower than we originally thought.

The exact mechanism of the beneficial effect is not completely understood.

Tetracycline reduces post-acne scarring.

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Drs. Forbes and King, 607 W. 14, Austin.

Diets to Control Diabetes Mellitus

Effect of Modification to Meet Dietary Habits of Indigent Anglo-, Negro-, and Latin-American Patients

GEORGE W. PERDUE, M.D.; HUGO T. ENGELHARDT, M.D.; and MARGUERITE CORONADO, B.S.

Houston, Texas

IT IS ACCEPTED generally that dietary measures are the fundamental basis for the treatment of diabetes mellitus. Patients are instructed in the desired diet, but in many instances they do not adhere to it.

In the diabetic clinic at the Jefferson Davis Hospital, there were approximately 780 patients, in about 40 per cent of whom the diabetes was not controlled. A thorough survey[1] of these patients revealed that failure to follow the prescribed diet was an important factor in lack of control. From this study, two factors became apparent, (1) the cost of food and (2) the type of foods listed on the diets. The clientele of the clinic was composed of 63 per cent Negro-Americans, 5 per cent Latin-Americans, and 32 per cent Anglo-Americans.

The food habits of these three groups were studied, and the diets of the clinic were modified into three types, with a suitable food habit for each group. In addition to supplying the food requirements, the cost was taken into consideration. Luchi[2] emphasized the importance of the food habits of

Dr. George W. Perdue is clinical assistant professor of internal medicine at Baylor University College of Medicine.

A study of diabetic diets of 100 out-patients in a large indigent hospital proved that adjustment in the diet of these people to their food habits and financial capabilities to buy food permitted them to obtain foods suitable for diabetic management. The diets were modified in three types: Anglo-American, Negro-American, and Latin-American.

Italians in diabetic diets and the control of the diabetes, but we have been unable to find any study of the food habits of Negro-Americans and Latin-Americans in the control of their diabetes.

In order to ascertain whether or not alteration of the dietary menu would modify the control of the diabetes, 100 patients who regularly attended the clinic were selected regardless of their diabetic control. The various racial groups were represented in this study in approximately the same proportion as the general clientele of the clinic.

Each patient was instructed carefully regarding the dietary changes and was given printed menus for reference. They were followed for 10 months after the dietary changes were made. The diabetes was severe enough to require moderate amounts of insulin in all cases and the only change made in the regimen was the diet modification. During the 10 months of dietary alterations, the diabetes was better controlled in 46 patients, as evidenced by disappearance or reduction of glycosuria. The patients were happier about the diets and many stated they were better able to follow them. In 12 instances the diabetes was less well controlled; the patients either developed glycosuria or the amount of glycosuria increased. There was no alteration in the control of the diabetes of 42 patients. Of this group, approximately one-half remained well controlled. The others were not well controlled, but glycosuria did not increase or decrease on an average over the 10 month period.

DISCUSSION

The data in the study of these 100 patients indicated that adjustment in the diet of diabetic patients to their food habits and to their financial capabilities to buy food in many instances may permit the patient to obtain foods suitable for diabetes management. Of the 46 patients with better controlled diabetes, on the dietary modification, many expressed that they were more satisfied with the diet because they could afford to purchase it, and others were pleased that they were able to eat the same type of foods their families ate and to which they were accustomed. The study indicated that these 46 patients improved when it became more practical for them to follow their diabetic regimens.

The 12 patients who exhibited increased glycosuria on the modified diets were studied to ascertain why their diabetes was less satisfactorily controlled. Of these, 4 readily admitted that they had not attempted to follow their diet either before or after the change. Two would not admit that they were not following the diet, but no other reason could be ascertained. One patient omitted insulin, 1 went into heart failure, 1 developed a carcinoma of the

TABLE 1.—*Previous Diet Meal Plan Containing 2,100 Calories.*

(Carbohydrate—170 Gm., Protein—105 Gm., Fat—105 Gm.)

Breakfast:	Cost
1 Serving dried fruit	$0.013
3 Eggs	.144
1 Cup cereal (oatmeal)	.016
1 Slice bread	.016
1 Cup milk, skimmed, powdered	.023
2 Tsp. oleo	.004
1 Cup coffee	.021
Lunch:	
3 Oz. lunch meat	.150
½ Cup potatoes	.015
½ Cup "B" vegetable	.020
1 Cup "A" vegetable (cabbage)	.015
1 Slice bread	.008
1 Cup milk, skimmed, powdered	.023
2 Tsp. oleo	.004
1 Orange	.034
1 Cup coffee	.021
Supper:	
3 Oz. meat	.230
½ Cup potatoes or substitute	.015
1 Cup "A" vegetable	.015
1 Slice bread	.008
2 Tsp. oleo	.004
1 Apple	.060
1 Cup coffee	.021
Total Cost of Meals	$0.890

TABLE 2.—*Anglo-American Meal Plan Containing 2,100 Calories.*

(Carbohydrate—220 Gm., Protein—80 Gm., Fat—100 Gm.)

Breakfast:	Cost
1 Serving fruit, dried	$0.013
1 Cup cereal, oatmeal	.016
1 Egg	.048
2 Slices bread	.016
1 Cup milk, skimmed, powdered	.023
3 Tsp. oleo	.006
1 Cup coffee	.021
Lunch:	
2 Oz. lunch meat	.100
1 Cup potatoes	.030
½ Cup "B" vegetable	.020
1 Cup "A" vegetable	.015
1 Slice bread	.008
1 Cup milk, skimmed, powdered	.023
3 Tsp. oleo	.006
1 Cup coffee	.021
Supper:	
2 Oz. meat	.015
1 Cup blackeyed peas	.024
1 Cup "A" vegetable	.025
2 Slices bread	.016
1 Orange	.034
1 Cup milk, skimmed, powdered	.023
3 Tsp. oleo	.006
1 Cup coffee	.021
Total Cost of Meals	$0.665

cervix, 2 had a peptic ulcer necessitating change of diet, and 1 died of pyelonephritis during the 10 months period. It is unlikely that the change in the diet was a factor in the increase in glycosuria in these 12 patients, except possibly in 2 instances. In both cases, indirect evidence indicated that they did not adhere strictly to the modified diet that fitted into their food habits.

It was of interest that we were able to reduce the cost of the daily food* per patient from 89 cents for the previous diet to 66.5 cents for the Anglo-American diet, 56.3 cents for the Negro-Americans, and 67.7 cents for the Latin American. The carbohydrate content of the diet was increased in all diets, and the protein content was reduced, but the fat content and caloric values were not materially altered.

TABLE 3.—*Negro-American Meal Plan Containing 2,100 Calories.*

(Carbohydrate—220 Gm., Protein—80 Gm., Fat—100 Gm.)

Breakfast:	Cost
1 Serving dried fruit	$0.013
1 Cup grits	.011
1 Egg	.048
2 Strips bacon	.018
2 Biscuits	.023
1 Tsp. oleo	.002
1 Cup milk, skimmed, powdered	.023
1 Cup coffee	.021
Lunch:	
1 Serving ham hocks with blackeyed peas	.074
1 Cup greens	.025
1 Serving cornbread	.028
1 Cup milk, skimmed, powdered	.023
1 Cup coffee	.021
Supper:	
1 Serving greens—2 oz. fresh pork	.107
1 Cup rice	.025
2 Biscuits	.023
1 Orange	.034
1 Cup milk, skimmed, powdered	.023
1 Cup coffee	.021
Total Cost of Meals	$0.563

Exchange List for Negro-American Patients.

Item	Constituents	Exchange
Blackeyed peas with ham hocks	1 Cup blackeyed peas	2 Bread
	2 Oz. ham	2 Meat
Turnip greens with ham hocks or bacon grease	1 Cup greens	Free
	2 Oz. ham or	2 Meat
	2 Tsp. grease	2 Fat
Grits	1 Cup	2 Bread
Pigs feet	2	3 Fat
Pork chops	1 Medium chop (lean)	2 Meat
Mustard greens or collard greens with grease	1 Cup greens	Free
	2 Tsp. grease	2 Fat
Cabbage with bacon grease	1 Cup cabbage	Free
	2 Tsp. grease	2 Fat
Rice	1 Cup	2 Bread
Hogs jaws		3 Fat
Cornbread	3 Squares	2 Bread
Biscuits	2 Medium	2 Bread

**Cost of foods at the time of the study was obtained from the local markets.*

TABLE 4.—*Latin-American Meal Plan Containing 2,100 Calories.*

(Carbohydrate—220 Gm., Protein—80 Gm., Fat—100 Gm.)

Breakfast:	Cost
1 Serving of dried fruit	$0.013
2 Eggs	.048
2 Tortillas (flour)	.020
3 Tsp. oleo	.006
1 Cup milk, skimmed, powdered	.023
1 Cup coffee	.021
Lunch:	
1 Cup rice with meat (2 oz.)	.164
½ Cup beans	.010
Lettuce	.015
2 Tortillas (corn)	.024
1 Cup milk, skimmed, powdered	.023
3 Tsp. grease	.020
1 Cup coffee	.021
Supper:	
2 Oz. meat	.150
1 Cup beans	.015
2 Tortillas (flour)	.020
3 Tsp. oleo	.006
1 Orange	.034
1 Cup milk, skimmed, powdered	.023
1 Cup coffee	.021
Total Cost of Meals	$0.677

Exchange List for Latin-American Patients.

Item	Constituents	Exchange
Arroz con carne (rice with meat)	1 Cup rice	2 Bread
	2 Oz. meat	2 Meat
	1 Tsp. fat	1 Fat
Fidello con carne (vermicelli with meat)	1 Cup vermicelli	2 Bread
	2 Oz. meat	2 Meat
	1 Tsp. fat	1 Fat
Papas con carne (potatoes with meat)	1 Cup potatoes	2 Bread
	2 Oz. meat	2 Meat
	1 Tsp. fat	1 Fat
Chicharo con carne (peas with meat)	1 Cup peas	2 "B" veg.
	2 Oz. meat	2 Meat
	1 Tsp. fat	1 Fat
Frijoles con jamon salado (pinto beans with salt pork)	1 Cup beans	2 Bread
	Salt pork for seasoning	2 Fat
Tortillas de arina (flour) 5 in. diameter by ⅛ in. thick	2 Tortillas	2 Bread
Tortillas de maiz (corn) 5 in. diameter by ⅛ in. thick	2 Tortillas	2 Bread
Enchiladas	2 Enchiladas	1 Bread
		1 Meat
Tamales	1 Tamale	1 Bread
		1 Meat

The exchange list for foods in the standard American Diabetes Association was applicable for the Anglo-American diets, but additional exchange lists had to be used in the Negro-American and Latin-American diets. Fortunately these two groups prefer little variation in menu, and the exchange list need not be large.

The sample menus with cost for each food and the exchange list for the Negro-American and Latin-American diets are listed in tables 1 through 4.

SUMMARY

Diabetic diets of 100 out-patients in a large indigent hospital were modified to fit into the patients' food habits and capability to pay for the foods.

The diets were modified into three types, Anglo-American, Negro-American, and Latin-American.

In 46 cases, the diet modification apparently permitted the patient to adhere more strictly to the prescribed diet. Modification of the diet did not alter the control of the diabetes in 42 patients. Control of the diabetes was less satisfactory in 12 patients, but this was not due to the modification of the diet.

The financial status and food habits of the patient should be taken into consideration in the diet prescription and menus given to diabetic patients.

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Drs. Perdue and Engelhardt, Department of Medicine, Baylor University College of Medicine, Houston.

Miss Coronado, Veterans Administration Hospital, Houston.

Program Aids Children With Unknown Deafness

Help for "The Child on the Outside," the youngster with an undetected hearing loss, is the goal of a program just made available to service organizations throughout the country by the Beltone Hearing Aid Company of Chicago. The entire program is aimed at helping communities establish a hearing conservation program in local schools with the assistance of service, civic, and educational organizations.

Officials of the hearing company base the program on the fact that it is estimated that some 5,000,000 youngsters suffer hearing impairments and that many thousands of these children are failing to develop properly because their hearing loss has not been discovered.

Anesthetic Deaths In Obstetrics

WILLIS H. JONDAHL, M.D.

Harlingen, Texas

ANESTHETIC DEATHS now rank fifth as a cause of death in obstetrics with hemorrhage, toxemia, infection, and heart disease being the first four causes.

Since the Committee on Maternal Mortality of the Texas Medical Association was founded, 253 maternal deaths have been reviewed, and 13 or 5.1 per cent of these were due to anesthesia.

Seven patients died under general anesthesia, 3 under spinal anesthesia, 2 with Pentothal, and 1 with Trilene and local anesthesia.

Cyclopropane was used as the anesthetic for a ruptured ectopic pregnancy and for a cesarean section in a case of placenta previa. Both patients needed transfusions prior to surgery and both died with a cardiac arrest.

Ether was used in 4 cases. One of these was for a cesarean section in a severe case of eclampsia and another was for an elective tubal ligation only 5 days after the patient had been in shock and congestive heart failure and had delivered a stillborn fetus. Both of these patients died on the operating table with a cardiac arrest. The third patient who died from ether anesthesia aspirated vomitus after returning to her room and suffocated. The fourth patient experienced respiratory arrest from ether after a long labor and considerable drugs for sedation, including Trilene analgesia for the last 5 hours of labor.

One patient died following a normal delivery un-

Dr. Willis H. Jondahl presented a longer discussion of this subject for the Texas Association of Obstetricians and Gynecologists on February 14, 1959, in Fort Worth.

Careful choice of anesthetic agents for patients with hemorrhage and eclampsia, skilled physicians or well trained nurse anesthetists, avoidance of inhalation anesthetics if the patient has eaten recently, minimum doses and saddle block technique for spinal anesthetics, supplementary emergency equipment, and wider use of pudendal block are recommended to reduce anesthetic deaths in obstetrics.

der ethylene gas. The patient vomited after delivery and died with aspiration asphyxia.

Two patients died during surgery for ectopic pregnancy, with sodium Pentothal being the only anesthetic in 1 case and with sodium Pentothal combined with nitrous oxide in the other.

There were 3 deaths from spinal anesthesia with Pontocaine being the drug used in all cases. One of these was in a critically ill patient with eclampsia who had been ill with severe preeclampsia for 2 months before a cesarean section was attempted. She died with spinal shock on the operation table. The other 2 deaths from spinal anesthesia occurred in a patient with placenta previa who was not in shock and in a patient undergoing prolonged labor in whom a cesarean section was to have been done for cephalopelvic disproportion. A postmortem section resulted in a 9 pound 15 ounce viable infant in this case. All 3 of these patients died with spinal shock resulting in respiratory and cardiac failure.

One patient was given Trilene gas for a normal delivery including an episiotomy. After the delivery, Metycaine was infiltrated into the episiotomy, and during the infiltration the patient had a convulsion and died.

In the 9 cases of death with general or Pentothal anesthesia, 7 were administered by nurse anesthetists, and 1 of the 3 spinal deaths occurred when the anesthesia was administered by an osteopathic physician.

Cardiac massage was used in 5 of the 13 cases, but was unsuccessful in all of them.

RECOMMENDATIONS

If deaths from anesthesia are to be reduced in obstetrics, the following recommendations are made:

1. A more careful choice of anesthetic agents in patients with hemorrhage and eclampsia should be made.
2. The use of skilled physicians or well trained nurses to administer the anesthetic should be required.
3. If the patient has eaten within the last 6 hours, inhalation anesthetics should be avoided.
4. If spinal anesthetics are used, minimal doses of the anesthetic agent and the "saddle block" technique are recommended.
5. Delivery rooms should be equipped with suction apparatus, airways, and a laryngoscope as well as intravenous fluids and vasopressor drugs.
6. A more widespread use of pudendal block for routine, uncomplicated delivery should be employed if skilled anesthetists are unavailable.

♦ Dr. Jondahl, 1724 East Ed Carey Drive, Harlingen.

Use of Basal Temperature Graphs in Habitual Aborters

Diagnosis and Evaluation of Therapy

PHILIP T. WILLIAMS, JR., M.D.

San Antonio, Texas

THE PROBLEM of the habitual aborter has been one of great concern to doctors and patients alike for many years. A multitude of probable etiological factors have been postulated, their numbers being exceeded only by the profusion, over the years, of proposals for management of such cases. There has been no one theory of etiology or therapy which has succeeded in providing the total answer, and this is not surprising in a condition which probably does not always result from one single cause. However, several ideas have persisted and seem well enough substantiated to have merit.

Etiologically: (1) The blighted ovum theory, which assumes that abortion results from fertilization of an ovum incapable of development into a normal fetus, has good basis in experimental fact and no doubt accounts for many otherwise unexplained abortions. (2) The congenitally deformed or traumatically damaged uterus would seem to be adequate explanation for a fair number of abortions. (3) Poor implantation of the ovum, either too low in the uterus or near the cornua, may explain some instances. (4) Inadequate hormonal support, while

Dr. Philip T. Williams, Jr. presented this paper for the Section on Obstetrics and Gynecology at the Texas Medical Association annual session April 22, 1958, in Houston.

A corpus luteum index based on basal temperatures appears to identify the woman who may abort on a hormonal basis prior to the abortion. With the help of this index it may be possible to carry the pregnancy to term by means of progesterone and stilbestrol therapy.

supported in theory by many, denied by many, is a satisfactory explanation for many repeated abortions but is difficult to prove because of the problem of determining those cases in which it may be an etiological factor.

Therapeutically: It seems pretty well established that treatment of an abortion already in the threatening stage is, at best, fraught with the threat of probable failure. Treatment of those aborters whose problem stems from physical abnormalities in ovum or uterus, even where possible prior to onset of symptoms, is certainly less than ideal in prognostic possibilities. To hope for any considerable degree of success in habitual aborter management, we must attempt to define the problem prior to pregnancy and institute therapy before or simultaneously with conception.

This paper concerns itself with a method for identifying the habitual aborter prior to pregnancy and for following her treatment before and after conception.

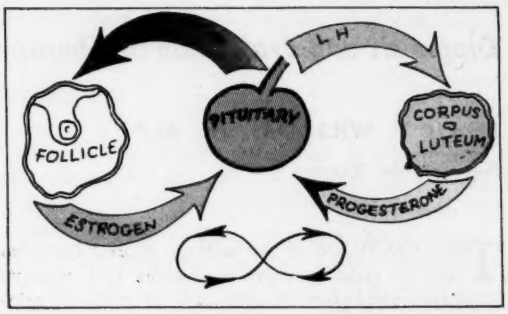

Fig. 1. Interrelationships of pituitary gonadotropic hormones and ovarian hormones, visualized as a figure of eight, in the female hormonal cycle.

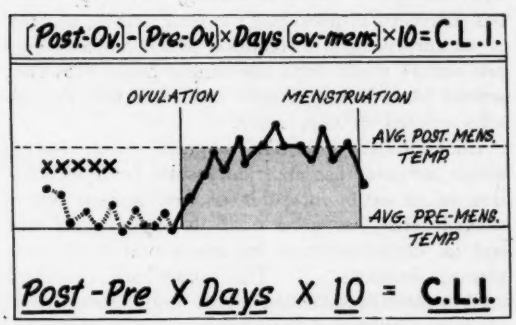

Fig. 2. Formula for calculating the corpus luteum index from the basal temperature graph of a nonpregnant patient.

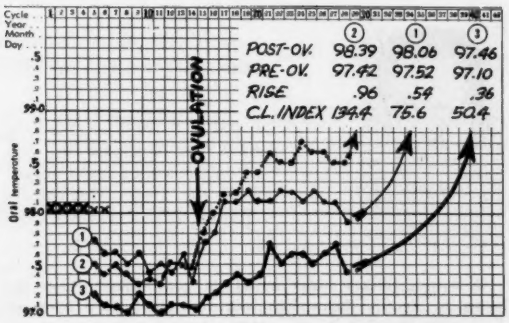

Fig. 3. Examples of corpus luteum indices calculated from temperature graphs, both normal and abnormal.

IDENTIFICATION OF ABORTER

The basic facts are these: In the normal menstrual cycle, ovulation is followed by conversion of the ruptured follicle into the corpus luteum, which, in the latter part of the cycle, produces progesterone as well as estrogen. The progesterone is the "ripening hormone" which prepares the endometrium for implantation of an ovum. When an ovum does implant itself, the continued production of progesterone in the early weeks of pregnancy supplies the stimulus to the uterus to further vascularization and encourages the relaxation needed to allow the conceptus to establish its own supporting mechanism in the chorionic structures which will ultimately make it

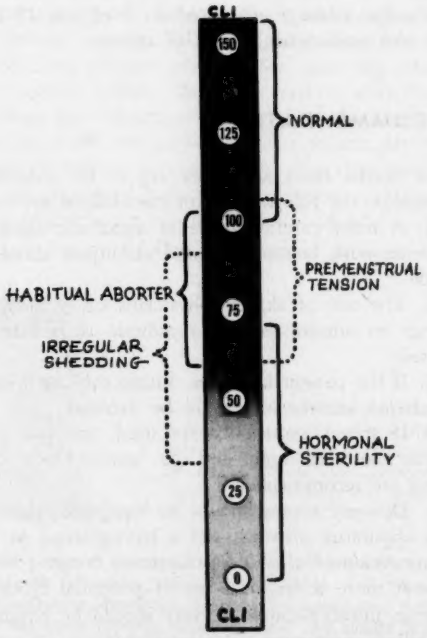

Fig. 4. Progesterone deficiency syndromes and approximate ranges at which they occur.

independent. When there is an inadequate production of progesterone by the corpus luteum, several things result: (1) The endometrium in which the ovum implants is not adequately "ripened" so that the initial growth of the conceptus is hindered and its progress toward self-sufficiency delayed or completely prevented. That is, its own ability to produce the progesterone and estrogen it needs falls behind the normal rate of development. (2) The inadequate corpus luteum itself ceases to be effectual in producing these hormones sooner than the normal structure. (3) The combination of these two deficiencies produces early loss of maternal hormonal support aggravated by delayed assumption of fetal self-sufficiency. (4) As a result the levels of progesterone drop off in the ninth to twelfth weeks of gestation and abortion results.

If it were possible to identify patients in whom this sequence of events is likely to occur, and if it were possible, in some way, to improve corpus luteum activity, then it might well be possible to avoid repeated abortions which are based on this type of functional defect.

Fortunately, the hormone progesterone in the body seems to have a thermogenic effect, long noted as the rise in basal body temperature which occurs in the female after ovulation and persists to just before the onset of the menstrual period. Hoping that this effect might be quantitative as well as qualitative, I have studied basal temperature charts of both normal women and habitual aborters for years. The results are interesting and, I believe, provide a simple clue to management of these cases.

In order more accurately to evaluate progesterone secretion by study of basal temperatures, I have developed a simple process of arriving at a figure I call the "corpus luteum index" from any particular cycle which is followed by basal temperatures. The average temperature before ovulation is determined using all temperatures which are taken after onset of the period and after the preceding cycle's progesterone effect is apparently spent, until the temperature rises at ovulation. This average is subtracted from the average temperature from ovulation to onset of the next menstrual bleeding. This "average difference" is then multiplied by the number of days from ovulation to menstruation, and the resulting figure is multiplied by ten. The resulting figure, the "corpus luteum index," represents the total number of .1 degree squares contained in a theoretical rectangle bounded on the graph by vertical lines at ovulation and onset of menstruation and horizontal lines representing average temperatures preovulation and postovulation.

I have calculated the corpus luteum index (CLI) on a number of normal women as well as on habitual aborters and on women with various menstrual irregularities and sterility problems. The results have been revealing in those types of problems where progesterone deficiency might be a factor. In comparing the indices of women with various progesterone related entities and normal women, the various clinical entities seem to fall in fairly well defined ranges of corpus luteum function:

Normal CLI	above 100
Habitual aborters	70-100
Premenstrual tension	65-105
Irregular shedding	50-90
Hormonal sterility	0-70

MANAGEMENT

Our concern in this paper is with the habitual aborter when the condition is caused by hormonal deficiency, and so we proceed from this point of identification, suspected by history, verified by CLI of less than 100, to the problem of treatment. If corpus luteum activity is low, the cause is most likely to be one of two things. Either (1) the pituitary gland is not producing adequate luteinizing hormone to produce a healthy corpus luteum or

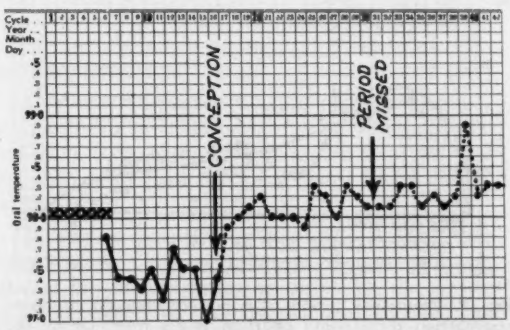

Fig. 5. Diagnosis of pregnancy by graph showing the sustained temperature elevation in early pregnancy.

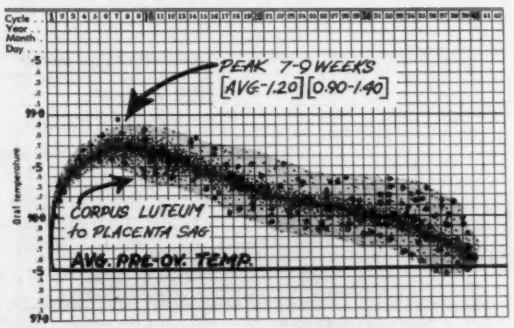

Fig. 6. Scatter graph of temperature graphs of pregnant women with no history of difficulty in carrying pregnancies and no symptoms in pregnancies. All curves are corrected to a base line of 97.5 (preovulation), which is the average normal level.

(2) the ovary is incapable of responding to the stimulus of the pituitary. Differentiation between these two possibilities could be made by hormone assays, but since these studies are not generally available and are expensive where available, I have used the trial and error method, as follows: Gonadogen, 20 units, is given on the sixth, ninth, and twelfth days of each cycle. This preparation is the follicle stimulating hormone of the pituitary, derived from pregnant mares' serum. Its use is rationalized by supposing that stimulus of follicle growth will produce a stronger ovum and more vascular follicle, which in turn will develop a stronger, more effective corpus luteum both by having a better follicle for its growth to stem from and by the effect of the increased estrogen's stimulus to the pituitary to form more pituitary luteinizing hormone.

In practice I have found that in about one-half of cases there is a progressive increase in CLI each month that Gonadogen is administered. These cases are deemed to represent a pituitary defect. When a CLI of 100 or more is attained, the patients are considered ready to support a pregnancy. In the remaining half of cases there is no significant change in CLI. These cases are deemed to represent an ovarian defect. I think that their best chance to carry a pregnancy to term lies in early and sustained augmentation therapy with progesterone. To this end they are given either 250 mg. of Delalutin at the time of ovulation or are given Colprosterone suppositories, 50 mg., one each night from ovulation to menstruation. If these patients conceive as demonstrated by maintenance of postovulatory temperature levels for at least 5 days beyond the expected time of onset of menses, then the Delalutin 250 mg. is continued once a week through the eighth lunar month of pregnancy, or the Colprosterone suppositories are continued nightly for the same time.

Once pregnancy is established basal temperatures are continued as a guide to the efficacy of the treatment being employed. The pattern of the basal temperature curve is reasonably set in normal pregnancies. As a result it is possible to anticipate trouble before actual symptoms appear. I have problem patients continue to take their basal temperatures throughout pregnancy. The temperatures, when charted by weekly averages, rise sharply the first 2 to 3 weeks, then rise slowly to a peak at from 7 to 9 weeks. After this time they slowly drop to the patient's preovulatory level at or near the time of onset of labor. The initial rise is a result of corpus luteum activity. This activity peaks at about 6 to 7 weeks and thereafter drops off sharply. I assume that the hormonogenic activity of the placenta builds up gradually from implantation (about 1 week) to a peak of progesterone secretion at about 9 to 10 weeks. Beyond this point the normal pregnancy is self sustaining, hormonally. Where the corpus luteum activity is foreshortened and/or the placental activity is slow in building up, a gap between the two sources of progesterone develops, and if the deficit is great enough, abortion occurs. I have noted frequently a definite "sag" in the basal temperature curves of supposedly normal pregnancies, which I

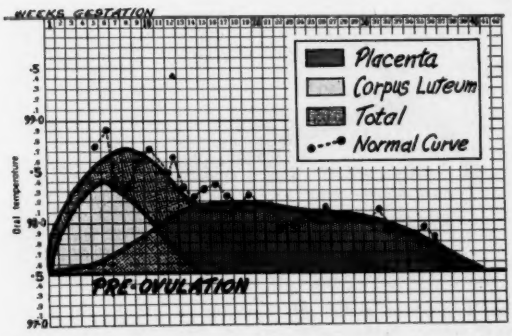

Fig. 7. Contribution to total progesterone secretion of the corpus luteum and the placenta. Also evident is the mechanism of "corpus luteum-placenta sag."

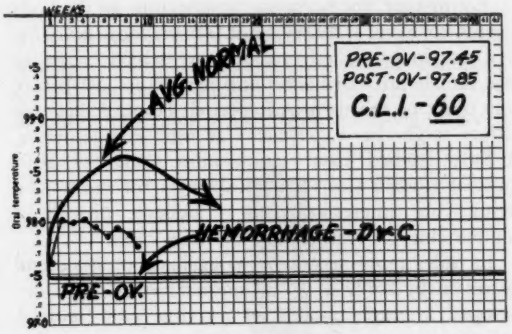

Fig. 8. Graphic course of a previously diagnosed habitual aborter in a pregnancy which terminated in abortion in the ninth week.

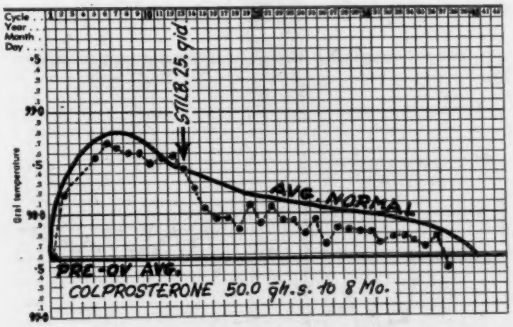

Fig. 9. Pregnancy graph of a patient thought to have approached threatening abortion levels from 13 to 16 weeks' gestation, carried to term on stilbestrol plus progesterone therapy.

interpret as intermediate stages of corpus luteum deficiency. I likewise have followed pregnancies which have aborted and watched the temperature curve rise then fall prematurely and fail to show a placental hormone recovery adequate to prevent abortion.

For the sake of completeness the following supplemental data must be added: (1) I believe that massive doses of stilbestrol have a definite quieting effect on the pregnant uterus, and therefore, (2) when patients on the regimens noted previously experience symptoms of threatening abortion, they are given stilbestrol approximately as per the Karnaky routine.[1] (3) It seems significant to note that, although by no means do all patients who are aborters and who carry their pregnancies to term receive stilbestrol, an appreciable number do have symptoms for which it is given and do continue on to term. (4) Further, it is considered interesting that a number of such patients produce basal temperature curves which suggest progesterone deficits that otherwise would be expected to be incompatible with a continuing pregnancy. This seems to support the notion that stilbestrol is capable of preventing abortions by its sedative effect on the uterus even though the level of progesterone has dropped to levels incompatible with such prevention. (5) I do not think that stilbestrol alone is adequate support for a hormonally lacking pregnancy before the stage where a secure implantation and placentation have been established (probably about 12 to 16 weeks' gestation). Beyond this stage stilbestrol may be valuable to maintain uterine quiescence where there is a degree of relative progesterone lack.

SUMMARY AND CONCLUSIONS

Experimental evidence suggests that quantitative evaluation of basal temperature values may make it possible to identify the hormonally caused habitual aborter when not pregnant. This type study needs substantiation in controlled surroundings by hormonal assays before it can be said to apply directly and incontrovertably.

Experimental evidence suggests that the progress, hormonally, of a pregnancy may be followed with reasonable accuracy by basal temperature curves and that therapy of habitual aborters may be evaluated by this means.

The studies included herein suggest strongly that prepregnancy pituitary hormone therapy may be capable in some instances of correcting the deficit which is responsible for the habitual aborter syndrome and, in any event, that by basal temperature studies it is possible to separate the corpus luteum deficiency due to pituitary deficiency from the corpus luteum deficiency due to ovarian failure.

I believe that the use of the corpus luteum index should make it possible to identify the woman who may abort on a hormonal basis even though she has not fulfilled the criteria now used, which require 3 abortions and no term pregnancies. This is important since it seems logical that, even though a patient may have carried pregnancies to term, she may become hormonally incapable of carrying a pregnancy at a later date.

Although it is true that many abortions cannot be prevented, in no one particular instance are we able to know that this particular pregnancy is hopeless. Therefore every effort possible within existing knowledge of the problem should be made to save each threatened abortion which comes under a physician's care.

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Dr. Williams, 929 Manor Drive, San Antonio.

Polio Incidence Drops 85 Per Cent

The incidence of poliomyelitis has dropped 85 per cent in the 3 year period ending in 1957, but paralytic polio, the ailment's most withering form, is increasing among preschool children. This changing trend in the polio picture is shown in the November issue of "Patterns of Disease," prepared by Parke, Davis, and Company.

Since 1955, the number of polio cases has dropped, from 28,985 cases in 1955 when the vaccination program was begun to 5,485 in 1957. Years of low polio incidence usually follow high ones, the report shows, and the only previous period during which incidence declined for 3 consecutive years was 1917 to 1919.

On the other hand, the study adds, children under 5 account for an increasing share of paralytic cases since 1955. That year, children in the under 5 age group accounted for 32 per cent of paralytic polio cases as compared with 45 per cent in 1957.

New Services Hike Hospital Costs

Underfinancing of hospitals in the face of mounting costs results in a deficit of services rather than a financial deficit, Robert M. Sigmond, executive director of the Hospital Council of Western Pennsylvania, Pittsburgh, reports.

In an article published in the October 16 issue of *Hospitals*, journal of the American Hospital Association, Mr. Sigmond points out that the underlying reason for the rise in hospital costs, as cited in the 1954 report of the Commission on Financing of Hospital Care, was found to be the steady broadening of the scope of hospital service resulting from advances in medical science.

CASE REPORTS

Accidental Radiation Dermatitis

Acute Reaction to Roentgen Rays

COLVIN H. AGNEW, M.D.

Galveston, Texas

WITH A REVIVAL of interest in radiation effects and with the wider recognition of radiation hazards, numerous articles have appeared concerning the effects of radiation—in chronic low doses—on the increase of mutations and the production of neoplasia. However, it has been some time since any article has described an acute roentgen-ray dermatitis occurring in medical practice. By calling attention to the accident reported here, it is hoped that this paper will serve to alert and forewarn those who perform fluoroscopy with equipment which has not been monitored.

REPORT OF CASE

Circumstances of Accidents.—A surgeon supported a patient's injured hand with his own left hand, exposing the dorsal aspect of the distal two-thirds of the second, third, and fourth digits. This patient had a metallic foreign body in the soft tissues of the second digit, near the metacarpal phalangeal joint. The surgeon's hand was in the primary, unattenuated beam, without the added protection of leaded gloves. A second patient's hand was supported in a similar fashion. However, in this case the foreign body was located in the soft tissues of the hypothenar eminence.

The roentgen-ray beam was initiated by a foot switch and was interrupted from time to time. However, the duration of the exposure was not recorded, since no cumulative timing device was employed. The peak kilovoltage was thought to be in the neighborhood of 70 KV, without additional filtration. No half value layer data were available. The dorsal aspect of the surgeon's hand was located about 10 cm. from the face of the tube, but could have been moved as close as 5 cm. during the fluoroscopy. The fluoroscopic screen was attached to a hood, which the surgeon wore over his head. No protective lead apron was worn.

Output.—On February 22, 1958, I monitored the radiation equipment and determined the output by the Victoreen r-chamber. The Victoreen 100 r-chamber was placed in the approximate position of the surgeon's hand, about 10 cm. from the face of the tube housing. There was no nearby scattering material. The average of several determinations was 180 r per minute (air). There was no way to regulate the beam size; there were no filters present. It was stated that there had been some filters present at the time of the accident, but these had been removed by the repairman.

Time-Dose Relationship.—The frequency of exposure played a part in this accident. The surgeon had the unique experience of employing this technique twice within a 2 week interval. Shortly after he had used the fluoroscope to locate the foreign body on the second patient, the first patient returned to the office for a follow-up visit. At this time, the surgeon noted the erythema, and the possibility of it being due to radiation was entertained.

Effects.—The first patient required little treatment; the second patient and the surgeon have required continuous observation and local treatment. About 1 week after the fluoroscopy, the skin of both the second patient and the surgeon became erythematous, and finally developed a wet reaction. These have never completely healed, in spite of intensive medical attention and the application of ointments.

About 6 months after the exposure, the lesions were excised, and staged skin grafts were started. It is not the purpose of this paper to describe the surgical details of these procedures. Generally, the proper treatment is skin replacement as necessary, and this has been carried out successfully.

HISTORICAL BACKGROUND

No attempt to exhaust early accounts of such accidents has been undertaken. The purpose of this section is to describe in some detail what was known at the turn of the century about such accidental overexposures. Within a few years after the discovery of x-rays, there were many epithelial carcinomas reported which were attributed to deliberate, but innocent, exposure to x-rays.

Dr. Colvin H. Agnew is assistant professor of radiology at the University of Texas Medical Branch.

A serious accidental radiation dermatitis occurring from use of fluoroscopy during surgery is reported. Skin grafts have been required. Serial roentgenograms instead of fluoroscopy might be considered. If fluoroscopy is used, equipment and operator should comply with existing regulations and recommendations to reduce the risk. Radiation surveys, especially for older machines, are recommended.

Porter[6] thought that the first published account of radiation induced skin cancer was written by Marcuse, entitled "Dermatitis und Alopecie Nach Durchluechtung mit Rontgenstrahlan," which appeared in the *Deutsche medizinische Wochenschrift* in 1896. Porter collected 10 cases of cancer developing in the skin of x-ray operators because of their continued exposure to x-ray even after recognition of the inflammation of the skin and persistent lesions. Porter added a case of his own to this collection and described his patient's exposure as lasting for several hours each day at a very short distance from a low vacuum tube. Eight months after commencing employment and exposure, the patient's hands were described in this way: "The hands became red and dry and, in a few days, very painful and greatly swollen." In spite of the fact that a 1 per cent Orthoform ointment had to be used almost continuously to relieve his intense pain, this patient continued his work until April 1, 1897, when the onset of another severe dermatitis, with the formation of pain and blisters "beyond description" necessitated ward treatment for 1 month. On July 19, the development of an ulcer with rather exuberant granulations and unhealthy looking edges was noted at the tip of the left forefinger. Pinpoint grafts "took" and grew. Accordingly, on August 13, under ether, all the ulcerated areas were cleaned, shaved down to an apparently normal base, and Thiersch-grafted. Fourteen different grafts were applied and, contrary to all expectations, a great majority of these grafts adhered and "have never broken down since, nor do they show the exzematous condition which exists on the areas not grafted," and "pain ceased absolutely from the time of operation." On October 31, 1902, both ring fingers were amputated to the knuckles. From October, 1902, until July, 1905, a dozen or more amputations were performed. As of April, 1907, the condition of the left hand is shown in figure 4.

In 1901, Huntington presented an account of "X-Ray Burns and Their Treatment" before the San

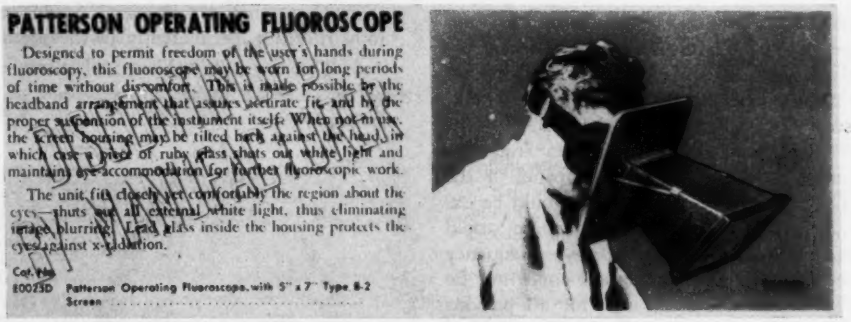
PATTERSON OPERATING FLUOROSCOPE
Designed to permit freedom of the user's hands during fluoroscopy, this fluoroscope may be worn for long periods of time without discomfort. This is made possible by the headband arrangement that assures accurate fit, and by the proper suspension of the instrument itself. When not in use, the screen housing may be tilted back against the head, in which case a piece of ruby glass shuts out white light and maintains eye accommodation for further fluoroscopic work.
The unit fits closely yet comfortably the region about the eyes—shuts out all external white light, thus eliminating image blurring. Lead glass inside the housing protects the eyes against x-radiation.
Cat. No.
E0023D Patterson Operating Fluoroscope, with 5" x 7" Type B-2 Screen

Fig. 1. The type of fluoroscopic screen employed when radiation dermatitis was initiated. One can read, through the surcharge "Discontinued by Manufacturer," that it was designed "to permit freedom of the user's hands during fluoroscopy, . . . may be worn for long periods of time." There is some comfort in "lead glass inside the housing protects the eyes against x-radiation."

Fig. 2. a. The surgeon's left hand. Damage involves the nails, as well as the skin of the second, third, and fourth digits.

b. Well established graft to the second and third digits of the surgeon's left hand. The atrophic skin along the medial aspect of the fourth digit is easily recognized.

Francisco Academy of Medicine. The pathogenesis was described as being initiated by irritation of the peripheral sensory nerves, with secondary paralysis of the vasomotor system of the affected areas. Spasmodic contraction of the arterioles followed, cell nutrition was impaired, and necrosis was the logical result. Progressive gangrene appeared 4 weeks after the injury, starting in the center and spreading peripherally. Intima of the arterioles and the veins was thickened, and the lumina correspondingly narrowed. Authorities generally agreed that medical treatment of radiation ulcers was highly unsatisfactory, if not altogether inefficient, and Huntington accordingly recommended Thiersch grafts.

The purpose of presenting these two accounts is to show how much was known concerning the hazards of radiation to the skin, the pathogenesis, and its treatment only some 5 years after Roentgen's discovery. Neither is necessarily the best or the earliest.

PREVENTION

Why did the reported accident happen? Certainly, the chief reason was that the surgeon did not realize the possible hazards and, particularly, the high output of the fluoroscope. In a well designed machine, the fluoroscopic output can be regulated so as to be well under 10 r per minute 18 inches from the target, which is at the surface of the panel or the table top. Under such circumstances, it would be extremely unlikely that acute radiation reaction would have occurred, but—depending upon the frequency of exposure—chronic radiation hazard could not be ignored. It probably would be well for all persons employing fluoroscopic techniques for the surgical removal of metallic foreign bodies to review their methods, to see if the surgical damage and the risk of infection to the tendons and nerve sheaths when employing serial roentgenograms outweigh the risk of radiation to the surgeon's hands.

Fig. 3. The patient's right hand, palmar surface down, showing the more intense effect, centrally with ulceration, the rather sharp margins of atrophic skin, and, finally, the normal skin still rich in normal hair follicles.

The National Bureau of Standards' Handbook 60, "X-Ray Protection," which was prepared by the National Committee on Radiation Protection—whose members come from the radiological societies, industrial hygiene associations, the National Bureau of Standards, and the armed forces—is the basis for codes being adopted by the state health departments. Compliance with the recommendations of this body would insure that no one would be subjected to excessive radiation hazards.

The recovery of small metallic fragments can be a time-consuming procedure. Serial roentgenograms can be made without any great additional risk of radiation damage to the patient or physician, but it is recognized that they do prolong the procedure. If the use of the fluoroscope is essential (and the necessity is uncommon), then it would be imperative that the equipment and the operator comply with the existing recommendations, some of which deserve to be extracted from the Handbook 60 and reinforced by this emphasis:

1. Limiting diaphragms and protective cones shall be employed.

2. There shall be at least 2.5 mm. of aluminum total filtration permanently in the useful beam.

3. The target to table panel distance *should not* be less than 18 inches and *shall not* be less than 12 inches.

Fig. 4. Left hand of Porter's patient, April, 1907.

4. The fluoroscopic screen shall be covered with a transparent protective material having a lead equivalent of at least .5 mm. aluminum for 100 pKV.

5. The dose rate, measured at the panel or table top, shall be less than 10 r per minute.

6. The fluoroscopic equipment shall be operated only by a properly trained individual.

7. Protective aprons shall be worn by the physician and, unless measurements indicate that they are not needed, protective gloves shall be worn by the fluoroscopist during every examination. The hands of the fluoroscopist shall never be placed in the useful beam unless the beam is attenuated by the patient.

Certain radiologists and physicists, by virtue of their interest and training, are qualified to make measurements and perform radiation surveys. Equipment of recent vintage usually meets all the recommendations of the National Committee on Radiation Protection. Much of the older equipment, unless it has been modified, poses a serious problem for the operator. It is strongly urged that qualified personnel be obtained to perform radiation surveys, particularly for these older machines. A "small" machine may have a high output.

SUMMARY

A serious accidental radiation dermatitis, due to an acute reaction to roentgen rays occurring because of the employment of fluoroscopy during an operative procedure, has been described.

Steps which may be taken to reduce the risk of employing a fluoroscope have been reiterated.

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Dr. Agnew, Department of Radiology, University of Texas Medical Branch, Galveston.

An institute devoted to the relationship between weather and human life has been organized under the name "The American Institute of Medical Climatology." Secretary of the organization, reports *Science* (January 23, 1959), is Igho H. Kornblueh, 1618 Allengrove St., Philadelphia 24.

Varicella Pneumonia

Report of a Case

KURT LEKISCH, M.D.

Midland, Texas

IN RECENT YEARS reports of severe varicella pneumonia in adults have been published. It is my purpose to describe an additional case with unusual roentgen-ray findings and to review the outstanding clinical features.

CASE REPORT

A. C. H., a 32 year old white man, was first examined on March 15, 1958, complaining of fever (104 F.) and rash of 2 days' duration. The patient's past history was negative except for encephalitis, type unknown, at the age of 28 years which cleared without sequelae. He had not had chickenpox. There was a known contact with varicella, his children having had typical chickenpox approximately 2 weeks previously.

The patient exhibited the classic rash of this disease, and in addition, typical lesions were found in the mucous membranes of the mouth and pharynx. On the fifth day of illness he developed shortness of breath and severe nonproductive cough. On the seventh day of illness pleuritic pain was felt in the left side of the chest, and a friction rub was heard in the left infra-axillary area. However, no rales were elicited. The physical examination of the lower extremities failed to demonstrate findings compatible with involvement of the superficial and deep veins.

Postero-anterior and left lateral chest roentgenograms revealed an area of dense mottled infiltration involving

Dr. Kurt Lekisch specializes in internal medicine.

A case of severe varicella pneumonia in a 32 year old man is presented. Unlike the usual pattern of diffuse pulmonary involvement, this disease was localized in the lower lobe of the left lung. Clinical and epidemiological evidence usually will suggest the diagnosis, which may be confirmed by demonstration of intranuclear inclusion bodies in pulmonary exudates.

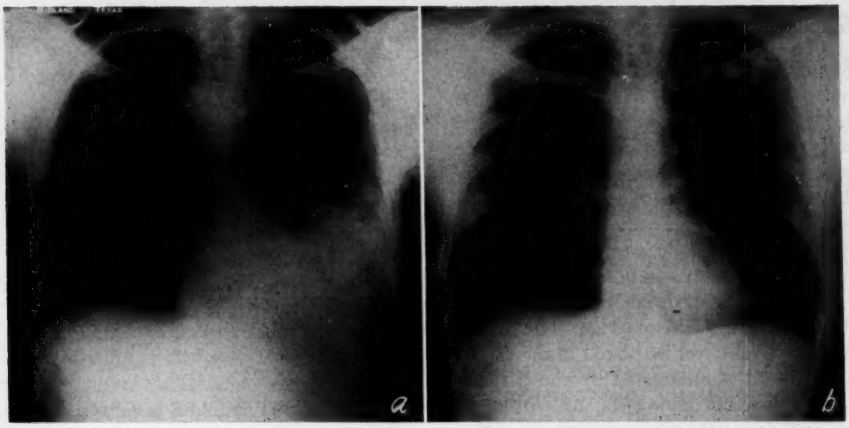

Fig. 1a. Roentgenogram made April 11, 1958, showing dense mottled infiltration of the lower field of the left lung.

b. Clearing of the lung shown in a roentgenogram made July 28, 1958, when the patient was clinically free of symptoms.

the major portions of the lower field of the left lung (fig. 1a). The parahilar lymph nodes showed no evidence of enlargement. The trachea was in the midline, and diaphragmatic contour was normal without elevation. The heart and great vessels were normal.

Laboratory studies revealed a normal white blood count and differential. Hemoglobin was 12.8 Gm. per 100 cc. Urinalysis was normal; the VDRL test for syphilis, negative. Multiple sputum examinations for acid fast bacilli, pyogenic bacterial pathogens, and fungi were negative on smear and culture. Intradermal injections of coccidioidin 1:100, histoplasmin 1:100, blastomycin 1:100, and purified protein derivative (tuberculin) first strength gave no reactions.

Bronchoscopy revealed no abnormalities, and bronchial washings were negative on routine culture for pathogenic organisms. Planograms of the left lower lobe on April 16 at 1 cm. intervals revealed the trachea and main stem bronchi to be normal in position and appearance without evidence of bronchial obstruction. No hilar nodes were shown. A homogeneous interstitial type of infiltration was found to involve the entire left lower lobe with the bronchi well delineated giving the appearance of the so-called air bronchogram. All these findings suggested subacute or chronic infectious process rather than neoplasm.

The patient was treated with chloramphenicol 250 mg. four times daily and salicylates for temperature above 103 F. He remained seriously ill for about 14 days. No clinical evidence of cardiac failure was noted. The chest pain persisted for 2 months, and the nonproductive cough lingered for several months. When last seen July 25, 1958, the patient was clinically free of symptoms, and a roentgenogram of the chest revealed complete clearing of the process in the left lower lobe with slight blunting of the left costophrenic angle (fig. 1b).

DISCUSSION

All the studies obtained in this case suggest that the pneumonia observed was caused by varicella virus. Most cases of varicella pneumonia reported in the literature[1-5] have occurred predominantly in young adults without history of previous varicella and after intimate and recent contact. There is evidence that this clinical entity is not a rare manifestation of adult chickenpox. The usual roentgenray findings are diffuse infiltrations involving all lung fields, similar to that in sarcoidosis, carcinomatosis,[3] or miliary tuberculosis. However, this patient exhibited intrinsic disease limited to the lower lobe of the left lung. Delay in clearing of the roentgenograms has been reported previously. Chemotherapeutic agents gave no obvious benefit other than possible protection against secondary bacterial infections. Morbidity is usually prolonged with slow convalescence.

It is pertinent to emphasize that severe chickenpox pneumonia is potentially a fatal disease. Such cases have been reported by Waring,[5] Fitz,[1, 4] and Krugman.[2] In their detailed postmortem studies typical pathological lesions of varicella in skin, pharynx, trachea, bronchi, lungs, pleural surfaces, mediastinal lymph nodes, myocardium, esophagus, liver, spleen, kidney, vaginal mucosa, and probably uterus were revealed. Microscopic sections identified the characteristic type A intranuclear inclusion bodies in the mononuclear cells of the pulmonary exudate, desquamated alveolar septal cells, cutaneous, esophageal, and hepatic lesions.

SUMMARY

A case of severe varicella pneumonia is presented which differs from the usual pattern of diffuse pulmonary involvement in that the disease was localized to the lower lobe of the left lung.

Clinical and epidemiological evidence usually will be sufficient to support strongly the diagnosis, which may be confirmed by demonstration of intranuclear inclusion bodies in pulmonary exudates.

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Dr. Lekisch, P. O. Box 852, Midland.

Agranulocytosis During Promazine (Sparine) Therapy

Report of a Case

JAMES E. KREISLE, M.D.

Austin, Texas

SINCE THE DISCOVERY, about 25 years ago, that aminopyrine may cause agranulocytosis in certain individuals, numerous other pharmacologic agents likewise have been found capable of the sporadic production of this syndrome. Among the various compounds in this category are certain of the antithyroid drugs, anticonvulsants, antihistaminics, and the sulfonamides and other antimicrobial agents.

In recent years several derivatives of phenothiazine, a substance commonly used to eradicate worms from sheep, have been widely employed in the treatment of psychiatric disorders in man. It is now well recognized that the use of one of these drugs, chlorpromazine (Thorazine), is occasionally attended by the development of agranulocytosis.[3, 6, 8] Promazine (Sparine), a more recently introduced phenothiazine derivative, is proving similarly toxic to some patients.

The American Medical Association Council on Drugs stated in October, 1957, that there had been 18 known instances of agranulocytosis associated with the use of promazine and that 4 of these had terminated fatally.[2] However, our survey of the literature has disclosed detailed descriptions of only 8 such cases,[1, 4, 5, 7, 9, 10] 3 of which were fatal.[4, 5, 10] It therefore seems worth while to describe an additional nonfatal case of agranulocytosis developing during promazine therapy.

CASE REPORT

J. R. P., a 57 year old male foreman, consulted me on May 28, 1958, because for the previous 6 weeks he had suffered recurrent episodes of heavy breathing, dizziness, and weakness. These attacks came without relation to effort. Several years previously he had consulted a physician because of palpitation. Paroxysmal atrial tachycardia was suspected, but the patient's main trouble was thought to be "nervousness." For years he had been considered a very nervous type of person, and during the 3 months prior to my examination he had been especially upset by problems relating to his work. He had long been a heavy smoker, using more than two packages of cigarettes daily. For about 5 years he had coughed regularly on arising mornings, producing only small amount of sputum and no blood.

The family history revealed nothing relevant, except that his only daughter had suffered from asthma in childhood.

In 1937 he had suffered a perineal injury which resulted in hematuria and nearly a year of disability, during which time the patient was under the care of a urologist. He had had an appendectomy at age 13 and a suprapubic prostate operation about 8 years previously.

Physical examination showed a well developed, wiry, muscular middle-aged man who seemed well except for an occasional hacking cough. The pulse was regular at 56 per minute, and the blood pressure was 112/74 mm. of mercury. General examination was not remarkable except for poor oral hygiene, several small, nontender nodes in the left axilla, a grade I systolic murmur heard in all cardiac areas, and slight bulging of both inguinal regions on cough.

Laboratory study showed the following: red blood count 4,800,000 per cubic millimeter; hemoglobin 13.1 Gm. per 100 cc.; white blood count 10,450 per cubic millimeter with 60 per cent segmented neutrophils, 5 per cent stabs, 31 per cent lymphocytes, and 4 per cent eosinophils; sedimentation rate 15 millimeters per hour (Wintrobe); VDRL test negative; urine, specific gravity 1.005, trace of albumin, no sugar, and 18 to 20 leukocytes per high power field in the centrifuged sediment.

Dr. James E. Kreisle is in the private practice of internal medicine.

A nonfatal case of agranulocytosis developing during promazine therapy in a 57 year old man is reported. Clinical features were typical of agranulocytosis occurring during administration of phenothiazine derivatives. Periodic blood counts in persons under therapy with these drugs may warn of impending danger. Treatment consists of omission of the offending drug and prevention and treatment of infection.

Chest fluoroscopy showed a vertical heart of normal size and shape. The lungs were clear except for slight accentuation of the bronchovascular marking in both hilar regions.

A 12 lead electrocardiogram showed sinus bradycardia but was otherwise not remarkable.

The patient was considered to have chronic tracheobronchitis related to excessive smoking, but it was thought that his symptoms were mainly those of an anxiety state with associated hyperventilation. Treatment consisted in discussion of emotional factors, reassurance regarding symptoms, advice to discontinue smoking, and the prescription of meprobamate, 1.0 Gm. daily.

There was transient improvement on this program. However, despite continued reassurance and 1.6 Gm. of meprobamate daily the patient became more agitated; and on June 20, 1958, he was examined by a psychiatrist, who was of the opinion that a state of depression had developed and instituted promazine (Sparine) therapy. From this date until August 4, the patient took a total of 21.875 Gm. of promazine in daily doses ranging from 150 to 700 mg. On this therapy his emotional state improved considerably.

On the evening of August 3, the patient began to feel chilly and developed a fever. His back hurt all night, and he had three loose stools on the following morning. When examined on August 4 he did not appear very ill, but his pulse rate was 104 per minute, and his temperature at noon was 101 F. The only other positive physical finding was the presence of slight tenderness in the right upper quadrant of the abdomen. A urinalysis was normal. The total leukocyte count was 2,750 per cubic millimeter, and all of the cells appeared to be lymphocytes. Promazine was discontinued, but the patient refused hospitalization until the following day.

At the time of hospital admission on August 5, the patient's pulse rate was 120 per minute and his temperature 104.4 F., but he was not prostrated. He complained of rectal pain, which he thought had started about 48 hours previously. The blood pressure was 134/72 mm. of mercury. There was swelling, redness, and tenderness about some old, crusted abrasions on the forearms, and several small furuncular lesions were present in the suboccipital region. A small hemorrhagic bleb with surrounding erythema was noted on the posterior aspect of the left thigh, and there was a similar lesion on the back. Both tonsils were moderately swollen and injected. The heart and lungs were negative. Slight tenderness was present just below the right costal margin. Rectal examination showed no unusual masses or tenderness. The remainder of the examination was negative.

Urinalysis showed traces of albumin and sugar, and occasional casts and leukocytes in the sediment. The urine was negative for bile. The serum bilirubin was 0.93 mg. per 100 cc. (0.74 mg. direct and 0.19 mg. indirect), and the thymol turbidity was 2 units. Hematologic data are listed in table 1. A blood culture showed no growth.

Initial treatment consisted in the daily administration of 2,000,000 units of "S-R" penicillin intramuscularly and 3.0 Gm. of erythromycin orally. Tetracycline, 400 mg. daily intramuscularly, was started on the second hospital day.

During the first 48 hours in the hospital the patient continued to run fever ranging between 101 and 104 F. orally. He complained of sore throat, and although the tonsils appeared red and edematous and showed traces of whitish exudate, ulceration did not occur. Pain in the rectal area increased in severity. On the second hospital day exquisite localized tenderness was noted just to the left of the anus.

On August 7, the third hospital day, in view of the patient's sustained fever and persistently low leukocyte count, 20 units of ACTH was administered by slow intravenous drip. Within less than 24 hours the temperature fell to normal, and the patient felt much better, so ACTH was continued in the form of gel, 40 units intramuscularly every 12 hours.

On August 8, the fourth hospital day, the patient felt generally much better, and the throat was less inflamed, but perianal pain was more severe, and there was definite induration to the left of the anus. The entire anal area was markedly tender.

A proctological consultant who examined the patient on August 9 advised drainage of what was considered to be a perianal abscess. Incision of the indurated area was performed under general anesthesia. Although the center of the area was soft and permitted introduction of a finger, no frank pus was encountered. Instead, only a small amount of serosanguineous material was discharged. Nevertheless, the patient was much relieved.

Although considerable perianal edema developed postoperatively, and catheter drainage of the bladder was required for a 72 hour period, the patient continued afebrile and improved steadily. Dihydrostreptomycin, 2.0 Gm. daily intramuscularly, was substituted for tetracycline, and the dose of penicillin was gradually reduced.

On August 10, 6 days following cessation of promazine

TABLE 1.—*Hematological Data in Case of Agranulocytosis During Promazine Therapy.*

Date (1958)	RBC (millions/ cu. mm.)	Hgb. (Gm./ 100 cc.)	WBC (per cu. mm.)	Differential Leukocyte Count (% of total)								Platelets (per cu. mm.)
				Segmented Neutrophils	Stab Neutrophils	Juvenile Neutrophils	Myelocytes	Lymphocytes	Monocytes	Eosinophils	Basophils	
5/28	4.8	13.1	10,450	60	5			31		4		
8/4			2,750					100				
8/5	4.35	14.1	2,450					100				321,000
8/5		12.5	1,100	1				90	9			
8/6			1,450					93	7			
8/7			850			1		87	12			
8/8		12.0	950					83	17			93,000
8/9		11.8	1,100		1	1		83	15			98,000
8/10			2,200	3	26			69	2			
8/10		10.6	5,000	6	26	4		60	4			
8/11		12.0	5,850	29	14	5		50	2			184,000
8/12		12.3	8,900	34	8	12		38	8			176,000
8/14		12.3	11,800	39	11	6	3	33	7		1	194,000
8/15		12.7	10,200	60	12			21	7			
8/22	4.15	11.7	9,600	53	6	1		37	3			252,000

therapy, the leukocyte count abruptly rose to 5,000 per cubic millimeter, and granulocytes reappeared in appreciable numbers. The dose of ACTH was gradually reduced, the drug being discontinued on August 12. At the time of discharge from the hospital on August 15 the patient showed a total leukocyte count of 10,200 per cubic millimeter with a normal differential, and the swelling about the anus was much reduced.

During his 10 days in the hospital the patient received 16,800,000 units of penicillin, 31.5 Gm. of erythromycin, 2.3 Gm. of tetracycline, 11.0 Gm. of dihydrostreptomycin, and 270 units of ACTH.

When the patient was examined 1 week following discharge from the hospital, he was feeling and looking well. The para-anal incision was still open, but swelling and induration had subsided. The blood picture, as indicated in table 1, was essentially normal.

COMMENT

The clinical features of the present case are typical of the agranulocytic syndrome developing during the administration of phenothiazine derivatives.[5, 6, 8] As in the case of antithyroid agents such as thiouracil, the disease tends to occur following the extended use, in susceptible persons, of relatively large doses of the drug; it is probably for this reason that agranulocytosis from chlorpromazine and promazine has occurred almost exclusively in patients with psychiatric disorders requiring such a chronic and intensive pattern of administration. In contrast, aminopyrine agranulocytosis, which has been shown to depend on an immunologic mechanism, may appear explosively on the single administration of minute doses to sensitive subjects.

From a limited number of observations it appears that the agranulocytic state associated with the use of phenothiazine derivatives may evolve in a gradual manner, the patient remaining asymptomatic until the onset of some complicating infection.[6] Hence, the use of periodic blood counts in persons under therapy with these drugs may serve to warn of impending danger. Certainly the least evidence of infection of any sort in such patients is an indication for prompt hematological investigation.

In figure 1 are presented, in terms of absolute cell concentrations, the hematologic changes which were observed in the present case. It is noteworthy that lymphocytes, blood platelets, and hemoglobin concentration were depressed along with the granulocytes, although not to critical levels. The presence of monocytes in the peripheral blood during the agranulocytic phase, as illustrated in figure 1, has been stated to be a favorable prognostic sign.[6]

It is generally agreed that the essential therapeutic measures in agranulocytosis are (1) omission of the offending drug and (2) prevention and treatment of infection. The antibacterial agents used should be given in generous dosage and cover a broad bacterial spectrum. Some have advised strict isolation technique in order to defend the patient against resistant strains of staphylococci.[6]

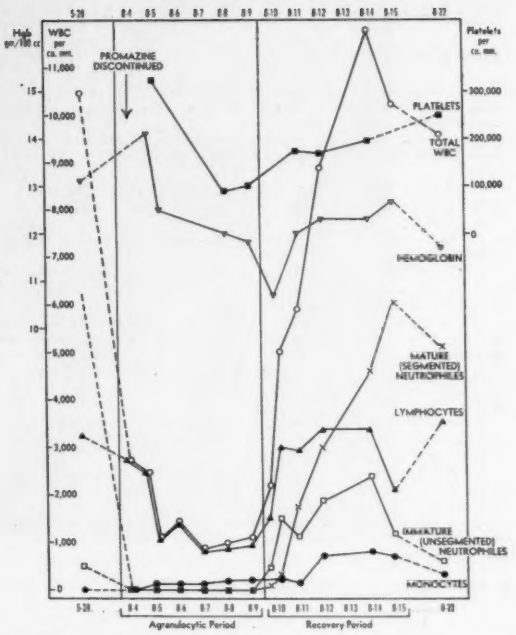

Fig. 1. Hematologic changes, in terms of cell concentrations, observed in a case of agranulocytosis during promazine therapy.

None of the various agents which have been claimed to stimulate granulocyte regeneration has attained universal acceptance. Although ACTH appeared to exert a dramatic antipyretic effect in this case, it is doubtful that its use was critical from the standpoint of hematologic recovery. In 4 of the previously reported cases of promazine agranulocytosis, untreated with ACTH or adrenal steroids,[5, 7, 9] granulocytes reappeared in a matter of days, while in 2 of the fatal cases[5, 10] steroids were administered to no avail. ACTH and adrenal steroids have given similarly equivocal results in the treatment of agranulocytosis due to chlorpromazine.[6]

SUMMARY

A nonfatal case of agranulocytosis developing during promazine (Sparine) therapy was reported.

Hematologic changes occurring in the agranulocytic and recovery phases of the disease were presented.

The case was discussed in relation to previously reported experience.

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Dr. Kreisle, 2317 Longview, Austin.

Benign Tumors In the First Portion Of the Duodenum

Case Presentations And Differential Diagnosis

MICHAEL J. HEALY, M.D., and ROBERT B. CONNOR, M.D.

Dallas, Texas

THE FIRST PORTION of the duodenum, the duodenal bulb, is perhaps the most frequently and carefully examined portion of the upper gastrointestinal tract. This is true because of the high incidence of peptic ulcer at this site and the accessibility of this portion of the small bowel to fluoroscopic visualization and manual palpation. Since ulcerative disease constitutes more than 80 per cent of the pathological entities occurring in the first portion of the duodenum, all other lesions are somewhat rare. Neoplasms occurring in the duodenum are found most frequently in the second portion of the duodenum. The malignant neoplasms are far more frequent than the benign. Therefore, primary benign tumors of the duodenal bulb actually are exceedingly rare.

Most of the reports appearing in the literature are concerned with small series of cases reported more or less as medical oddities or as postmortem studies in which an ante mortem diagnosis was not made.

In the past 6 months we have encountered 2 cases of benign duodenal tumor, both of which were unsuspected clinically. Because of the remarkable radiographic and fluoroscopic similarity between the two lesions, though they differed histologically, and because of the lack of invasion of the duodenal wall or distortion thereof, the preoperative diagnosis of benign duodenal neoplasm was made in both cases.

Dr. Michael J. Healy presented this paper before the Section on Radiology at the Texas Medical Association's annual session on April 22, 1958, in Houston.

Two cases of benign polypoid tumors of the first portion of the duodenum were demonstrated roentgenologically and proved surgically. Patients complained of vague upper abdominal distress, with a hint of questionable partial obstruction occurring intermittently. Such cases should be subject to operation, with an immediate frozen section being made to exclude the possibility of malignant change.

CASE PRESENTATIONS

CASE 1.—Miss C. H., a 27 year old white unmarried medical technologist, had been ill intermittently for 5 months prior to her admission to the hospital. These episodes of illness were characterized by nausea, cramping, and midepigastric pain. There was no radiation of the pain. There usually was vomiting of partially digested food the first day, followed by several days of pain and nausea without vomiting.

The patient stated that her "stomach" rumbled "vigorously" even when her more painful symptoms were not present. At times she felt as if she wished to belch, but was unable to do so. There was no history of hematemesis, diarrhea, bloody or tarry stools, jaundice, or weight loss. The past history and family history were noncontributory.

Physical examination revealed an asthenic, apparently healthy young woman. The remainder of the examination, including examination of the abdomen, was entirely within normal limits.

Roentgenologic examination of the upper gastrointestinal tract was entirely normal with the exception of the duodenum (fig. 1 and 2). The duodenal bulb filled with ease and revealed a normal smooth contour. Along the superior aspect of the base of the bulb was a constant polypoid defect measuring approximately 1.5 cm. in great-

Fig. 1. Case 1. Roentgenograms of the upper gastrointestinal tract revealing the filling defect in the barium filled duodenal bulb (left) and the lesion well outlined in the air filled duodenal bulb with the patient in the left posterior oblique position (right).

Fig. 2. Case 1. Spot roentgenogram with slight pressure revealing the smooth contour of the tumor within the duodenal bulb.

est diameter. The lesion was attached by a broad base to the superior wall of the bulb and could not be moved by the palpating finger. There was no evidence of obstruction. No distortion of the bowel wall was noted at the site of attachment of the polypoid lesion. To confirm these findings, a repeat upper gastrointestinal tract study was performed 3 days later, and the lesion was demonstrated again. Roentgen diagnosis was as follows: "Duodenal polyp, most probably benign, along the lesser curvature aspect of the duodenal bulb near the base."

Exploratory laparotomy was performed, and the lesion was located easily in the base of the duodenal bulb by palpation. The duodenum was opened and the polyp was found to be attached to the superior wall of the duodenum by means of a broad pedicle. The polyp, as well as a cuff of duodenal mucosa, was resected easily. Immediate frozen section revealed no evidence of malignancy. The appearance was that of hyperplasia of Brunner's glands.

Pathological examination revealed the lesion to consist of a polypoid nodule of tissues, covered by mucosa, measuring 22 by 14 by 22 mm. The tip was hemorrhagic. A 5 mm. stalk and a narrow cuff of duodenal mucosa was included in the specimen. Upon sectioning, a well circumscribed, nonencapsulated, firm, gray-white, cellular area showing a lobular pattern was seen underneath the mucosa. On microscopic examination (fig. 3), the cellular area described was scattered with chronic inflammatory

Fig. 3. Case 1. Photomicrograph of the entire surgical specimen showing the tumor nodule to be composed of Brunner's glands. The neoplasm is covered with normal duodenal mucosa.

cells. The covering mucosa was edematous, and there were fresh focal hemorrhages. Histologic diagnosis was "localized Brunner's glands hyperplasia with associated polyp formation, benign."

CASE 2.—Mrs. R. M. McC., a 48 year old white housewife, complained of a full feeling in the epigastrium as well as cramping and burning following meals of approximately 5 months' duration. There was only infrequent vomiting, and this consisted of bile stained fluid. The patient had a vague history of 1 or 2 episodes of melena and several episodes of scanty amounts of bright red blood in the stool. When first seen the patient stated that she had lost 25 pounds in weight in the past 6 months. A physical examination was entirely within normal limits except for moderate obesity. Her past history and family history were noncontributory.

Roentgenologic examination of the upper gastrointestinal tract was normal with the exception of the first portion of the duodenum (fig. 4 and 5). Along the inferior aspect of the base of the duodenal bulb, a constant filling defect measuring approximately 1.5 cm. in diameter was demonstrated. This was attached by a broad pedicle to the base of the duodenal bulb. It could not be moved within the bulb. No obstruction was encountered. Aside from location in the bulb, the findings in this case were almost identical with the findings in case 1. Preoperative roentgen diagnosis was as follows: "Benign polypoid tumor involving the duodenal bulb at its base, without evidence of deformity of the contour of the bulb." A colon examination performed prior to operation was negative, and a cholecystogram revealed a normally functioning gallbladder containing numerous cholesterin calculi.

At exploratory laparotomy, careful palpation of the duodenal bulb failed to reveal the polyp diagnosed preoperatively. An incision was made over the first part of the duodenum, and the polyp was exposed easily. In addition to the larger polyp at the base of the bulb, a very small lesion having similar appearance was found approximately 1 cm. distal to the described polyp. Both polyps were excised, along with a cuff of duodenal mucosa. Frozen section of the lesions in the operating room revealed no evidence of malignancy. A cholecystectomy also was performed.

Pathologic examination of the tissue received from the duodenum revealed a polypoid mass on a broad pedicle, measuring approximately 20 by 10 mm. The outer surface was reddish brown in color. On cut section, a firm white round nodule 8 mm. in diameter was disclosed in the center. A much smaller lesion, measuring approximately 3 mm. in greatest diameter, also was received and had a similar appearance on the gross cut section.

Microscopically (fig. 6), the firm white nodule consisted of smooth muscle cells and fibrous tissue which in most areas had become very hyalinized. Scattered in the nodule were nests of lymphocytes and a few plasma cells. Intact mucosa covered nests of Brunner's glands. In the stalk, there were remnants of the normal smooth muscle and mucosa. Histologic diagnosis was "Leiomyoma." The smaller nodule had a similar architecture, and was also a leiomyoma.

Fig. 4. Case 2. Roentgenogram of the upper gastrointestinal tract revealing the smooth filling defect in the barium filled duodenum. Note the similarity in size and conformation with the lesion in figure 1.

GENERAL COMMENT

These 2 cases presented remarkably similar roentgen appearances although the lesions differed histologically. They were both located in the duodenal bulb. Both were of approximately the same size and were attached firmly to the wall of the duodenum by broad pedicles. They could not be moved within the duodenal bulb. Clinical symptoms in both cases were somewhat vague and in no way suggested the underlying lesion. A review of the literature shows a good deal of similarity between the appearance of these 2 cases and other cases of benign tumors of the first portion of the duodenal bulb.

We believe that when a round, sharply defined filling defect having a broad pedicle and firmly attached to the duodenal wall is encountered, a diagnosis of benign duodenal tumor is warranted. Further, we think that all such cases should be subjected to operation since they do produce symptoms, even though vague, and surgical resection is usually completely curative. The unusual possibility of malignant change can be excluded at the time of operation by immediate frozen section.

DIFFERENTIAL DIAGNOSIS

In differential diagnosis, all tumors which can occur in the first portion of the duodenum should be considered. There are several other entities which also should be excluded.

Antral Gastric Polyp.—Occasionally a polyp in the distal portion of the stomach will prolapse

through the duodenal bulb and present itself as a filling defect in the base of the bulb. Manipulating the polyp back through the pylorus to its true location in the distal stomach will serve to differentiate the two lesions.

Prolapsed Gastric Mucosa.—A large cuff of gastric mucosa prolapsing through the pylorus into the base of the duodenal bulb could simulate a neoplasm there. Demonstration of gastric rugae should be possible, however. Also, the mucosa frequently can be displaced back into the antrum by manipulation at fluoroscopy. Demonstration of the other characteristic findings in this entity, such as widening of the pyloric canal and the "umbrella" defect in the base of the bulb, should make a differential diagnosis possible.

Hyperplasia of Brunner's Glands.—Hyperplasia of Brunner's glands is not true neoplasia, and is seen not infrequently in asymptomatic patients (fig. 7). Hyperplasia of nests of Brunner's glands causes a "cobble stone" appearance in the duodenal bulb on compression. The appearance is fairly characteristic.

Aberrant Pancreatic Tissue.—Pancreatic tissue can occur in the wall of the duodenal bulb, but it usually causes distortion of the contour of the wall at its site of origin. It may undergo ulceration.

Mucosal Edema, Secondary to Duodenal Ulcer.—At times, the mucosal edema accompanying an acute duodenal ulcer may be difficult to differentiate from a filling defect due to tumor. Demonstration of the actual crater should help in differentiating the two. But if the crater cannot be demonstrated, repeat examination following vigorous therapy should show change in the defect caused by the edema.

Retained Food or Bezoar.—Since material passes quickly from the duodenal bulb into the proximal small bowel by peristaltic activity or manipulation under fluoroscopy, retained food or bezoars are re-

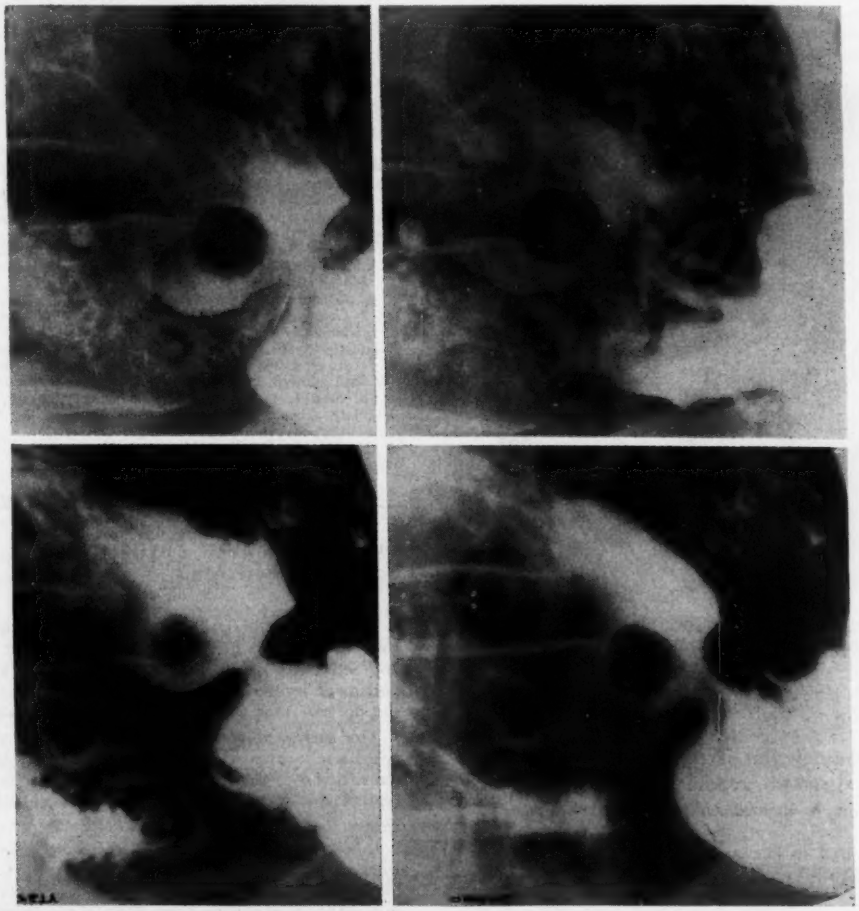

Fig. 5. Case 2. Spot roentgenograms of the duodenal bulb revealing the smooth tumor at the base of the bulb. In the lower right film, the secondary small neoplasm is seen well just distal to the large tumor.

Fig. 6. Case 2. Photomicrograph of the larger of the 2 leiomyomas within the duodenum showing the lesion to be a well defined nodule of colagenous tumor tissue.

Fig. 7. Roentgenogram of the upper gastrointestinal tract in an asymptomatic patient revealing several filling defects in the distal portion of the duodenal bulb consistent with hyperplasia of Brunner's glands. Note the "cobble-stone" effect produced.

mote possibilities. But if these are considered in a differential diagnosis, repeat examination should reveal a change in location of the questionable defect.

SUMMARY

Two cases of benign polypoid tumors of the first portion of the duodenum are reported. Both were demonstrated roentgenologically and proved surgically. Both patients complained of vague upper abdominal distress, with a hint of questionable partial obstruction occurring intermittently in both. Both lesions were smooth, immovable within the duodenal bulb, and attached to the wall of the duodenum by a broad pedicle. There was no distortion of the wall of the duodenal bulb by either lesion. The first lesion was shown to be a Brunneroma, while the second was a typical leiomyoma. The second case actually showed 2 leiomyomas in the duodenal bulb, but the larger one was demonstrated far more easily and dominated the roentgenologic appearance.

Demonstrations of such lesions should be relatively easy in this accessible portion of the gastrointestinal tract, and the benign nature of these tumors should be suspected from their appearance. Operation for their removal is indicated and usually is curative. Immediate frozen section should be done on all of these lesions to exclude the remote possibility of malignant change. A differential diagnosis is presented.

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Dr. Healy, St. Paul Hospital, Dallas.
Dr. Connor, 8215 Westchester, Dallas.

Survey Says Most Physicians Scan All Their Mail

Fifty per cent of 1,508 physicians reported that they open their own mail as against 50 per cent who let their nurses and secretaries do the job, according to results of a mail poll made by the Medical Advertising Service to determine the doctors' routine and attitudes on direct mail received.

The survey pointed out that 50 per cent of the secretaries and nurses who opened the doctors' mail pass all the mail on to the doctors. This means that nearly 74 per cent of the doctors in the survey at least look at all the mail.

In answer to the question "Of the direct mail you receive what percentage do you feel is of value to you?" were the following replies: 138 answered under 5 per cent is of value; 563, 5 to 20 per cent; 297, 20 to 40 per cent; 251, 40 to 60 per cent; 96, 60 to 80 per cent; and 73, 80 per cent.

Spontaneous Rupture of the Stomach in Two Premature Newborn Siblings

KEMAL OZKARAGOZ, M.D., and C. SCOTT STEWART, M.D.

San Antonio, Texas

THE PURPOSE of this paper is to report 2 additional cases of spontaneous perforation of the stomach in the neonatal period. We can find no report in literature of this occurrence in siblings. The cases reported in this paper occurred in successive premature siblings.

In rupture or perforation of the stomach in the newborn, clinical symptoms usually arise during the first week. Early symptoms of refusal of food, vomiting, discomfort, and abdominal distention are soon followed by evidence of peritonitis. Roentgen-ray evidence of air in the peritoneal cavity is conclusive evidence of a defect in the wall of the stomach or bowel. If this procedure is done early, surgical repair may be accomplished before the later classical symptoms of peritonitis are evident.

PATHOLOGY

The etiology of perforation of the stomach in the newborn is varied. Some cases have clearly resulted from trauma by catheters and feeding tubes. Others are related to necrosis and ulceration in severe systemic infections. Some have apparently resulted from acute gastric ulcer per se. Rupture has occurred in the presence of an obstruction distal to the stomach. Many apparently have been caused by a localized congenital deficiency of the muscle coat which may result in perforation directly or in the development of a diverticulum at the site of the muscle deficiency with a subsequent rupture of the diverticulum. In the most recent reported cases, trauma and the occurrence of muscle deficiency are the most frequently reported causes of perforation.[84]

CASE REPORTS

CASE 1.—This Negro boy was born February 21, 1955, weighing 4 pounds 14 ounces at an estimated 8 months' gestation. The family history was negative and the pregnancy uneventful. Labor was induced because of premature separation of the placenta. The condition at birth was good. The stomach was aspirated at birth with a 10 French soft rubber catheter and a 50 cc. syringe. Dextri-Maltose solution, offered at 30 hours, was taken well by nipple. Dryco 1:3 was started at 48 hours and was well tolerated. The first meconium stool, noted at 36 hours, was normal and changed to a soft yellow on the third day.

The baby weighed 4 pounds 11 ounces on the fourth day. On the morning of the fourth day the child was in good condition and had been taking feedings well. At 10 a. m. the baby refused his feeding and the nurse noted some abdominal distention. Enemas were given at 11 a. m. and 1 p. m. without relief of the distention. The infant vomited at 2:30 p. m. Roentgenograms of the abdomen at 5:30 p. m. showed free air under the diaphragm. Laparotomy was performed at 10:45 p. m. approximately 12½ hours after the onset of the symptoms. Milk and fibrinous exudate were found on the peritoneal surfaces. A longitudinal opening, approximately 2 cm. in length, was found in the midportion of the greater curvature of the stomach at the attachment of the omentum. There was no inflammatory reaction at the edge of the rent, and there was no visible ulceration of the mucosa. No sections were taken. The opening was closed, serosa to serosa, the abdomen closed, and the child removed from surgery at 11 p. m. Despite preoperative and postoperative antibiotics, supportive intravenous fluid therapy, and transfusion, the infant developed progressive evidence of toxemia and shock and died at 5:15 a. m., 6 hours after surgery and 20 hours after onset of symptoms.

CASE 2.—This Negro girl was born December 4, 1955, weighing 4 pounds 5 ounces at an estimated 8 months' gestation, following induction of labor because of premature separation of the placenta. The condition at birth was good, and delivery was accomplished without incident. The stomach was aspirated with a 10 French soft rubber catheter. Dextri-Maltose solution was started at 48 hours. The first meconium stool was noted at 48 hours, followed by a normal stool pattern. Dryco 1:3 was started at 72 hours, and was taken well and retained.

On the fourth day the general condition was excellent until the baby refused her 10 a. m. feeding. At 10:30 a. m. distention was noted, and she vomited what appeared to be the 6:00 a. m. feeding. A flat plate of the abdomen

Dr. Kemal Ozkaragoz, now at the Driscoll Foundation Children's Hospital in Corpus Christi, and his co-author report these cases from Santa Rosa Hospital, San Antonio.

Two cases of spontaneous perforation of the stomach in premature siblings with 1 survival are described. Both infants had almost identical symptoms—refusal of food after former eagerness, distention, vomiting, and air in the peritoneum. The cause of perforation seemed to be a localized congenital deficiency of the muscular wall of the stomach, which may suggest a genetic defect.

TABLE 1.—*Spontaneous Rupture of the Stomach in Newborn.*

Case	Author	Sex	Race	Age at Onset of Symptoms (days)	Gestation	Site of Perforation	Intubation	Laparotomy	Results
1	Siebold, 1825	—	—	2	—	Lesser curvature	—	—	D
2	Busch, 1826	—	—	7	—	Greater curvature, anterior wall	—	—	D
3	Binz, 1865	F	—	11	—	Greater curvature	—	—	D
4	Ritter, 1882	F	—	½	—	Anterior wall	—	—	D
5	Sawtel, 1885	M	—	3	—	Posterior wall	—	—	D
6	Bisset, 1905	M	—	1	—	Posterior wall, cardia	—	—	D
7	Lee & Wells, 1923	M	—	10	—	Posterior wall	—	—	D
8	Butka, 1927	—	—	4	—	Greater curvature	—	—	D
9	Stern, 1929	—	—	1	—	Lesser curvature, posterior wall	—	+	D
10	Dunham & Goldstein, 1933	M	W	4	Full term	Greater curvature	—	+	D
11	Dunham & Goldstein, 1933	M	W	2	Premature	Greater curvature, posterior wall	+	0	D
12	Smythe, 1934	F	N	4	Full term	Posterior wall, near greater curvature	0	0	D
13	Smythe, 1934	M	N	6	Full term	Lesser curvature	+	+	D
14	Tow & Ross, 1938	M	W	3	Full term	Greater curvature	0	0	D
15	Quinn, 1940	—	—	2	—	Anterior, close to cardia	0	+	D
16	Herbut, 1943	M	N	3	Full term	Greater curvature	+	0	D
17	Pedergrass & Booth, 1946	F	N	3	Full term	Lesser curvature, greater curvature	0	+	D
18	Tudor, 1950	M	W	5	Full term	Greater curvature	0	0	D
19	Wright & Scott, 1950	M	N	5	Full term	Lesser curvature	+	0	D
20	Ross et al, 1951	M	W	4	Full term	Greater curvature	+	0	D
21	Ross et al, 1951	M	W	3	Full term	Greater curvature	0	+	L
22	Kellogg et al, 1951	M	W	½	Full term	Greater curvature	0	+	L
23	Beattie & Bohan, 1952	F	N	4	Premature	Lesser curvature	0	+	L
24	Green & Gose, 1953	M	W	3	Full term	Greater curvature	0	+	D
25	Green & Gose, 1953	M	W	3	Full term	Anterior surface of stomach	0	0	D

(Table 1 continued next page.)

in upright position showed free air beneath the diaphragm. Laparotomy was performed under local anesthesia at 1:05 p. m. A longitudinal tear was found in the lesser curvature approximately 2 cm. in length. The rent was repaired, the abdomen closed, and the child removed from surgery in good condition at 1:30 p. m. The postoperative course was stormy with vomiting and distention during the first 36 hours, despite the maintenance of gastric suction. Fluids by mouth were started 48 hours following operation. Formula was well taken at 72 hours. Recovery was thereafter uneventful. The baby was discharged at the age of 25 days, 20 days postoperative, weighing 5 pounds 2 ounces. Subsequent course and development have been normal.

DISCUSSION

These 2 infants were remarkably similar in prenatal, natal, and neonatal history and course. The onset of symptoms was almost identical, showing first a refusal of feeding where there had been formerly eagerness, and then distention. Vomiting manifested itself immediately in case 2 and after a delay of about 2 hours in case 1. There was no cyanosis, little dyspnea, and almost no evidence of shock. The abdomen, while distended, was not rigid nor apparently tender. Bowel movements were absent, and the abdomen was tympanitic. Acute dilatation of the stomach was considered in the first child, but distention was not so striking in case 2. The abdomen became rather rigid prior to surgery in case 1, at which time the patient showed some evidence of shock.

The diagnosis was established in each case by roentgen ray demonstrating free air in the peritoneum. Our radiologist believes that lateral decubitus films are useful in demonstrating free air in the peritoneum in young infants.

The speed with which the diagnosis was established and surgical intervention accomplished in the second case was due to knowledge of the pediatrician of the course of the preceding sibling, and the striking similarity of symptomatology in the 2 infants.

TABLE 1.—*Spontaneous Rupture of the Stomach in Newborn* (continued).

Case	Author	Sex	Race	Age at Onset of Symptoms (days)	Gestation	Site of Perforation	Intubation	Laparotomy	Results
26	Braunstein, 1954	F	N	10	Premature	Greater curvature	+	0	D
27	Braunstein, 1954	F	N	2	Full term	Anterior wall	+	0	D
28	Braunstein, 1954	M	N	3	Premature	Greater curvature	0	0	D
29	Braunstein, 1954	M	N	9	Full term	Greater curvature	+	0	D
30	Braunstein, 1954	M	N	5	Premature	Greater curvature	0	+	L
31	Griffin, 1954	M	W	5	Full term	Fundus of stomach	+	0	D
32	Northway et al, 1954	M	N	3	Full term	Greater curvature	+	+	L
33	Fomon et al, 1954	F	N	2	Full term	Superior ⅓ of anterior wall of stomach	+	+	D
34	Arnold, 1955	M	W	5	Premature	Anterior surface of stomach near greater curvature	0	+	L
35	Mann et al, 1955	M	N	2	Full term	Greater curvature	0	+	L
36	Wilson, 1955	—	—	3	Full term	Lesser curvature	0	0	D
37	Vargas et al, 1955	M	—	6	Full term	Greater curvature	0	0	D
38	Vargas et al, 1955	F	—	2	Premature	Greater curvature	0	+	D
39	Vargas et al, 1955	M	—	—	Full term	Posterior stomach	0	0	D
40	Vargas et al, 1955	M	—	2	Premature	Anterior tear	0	+	D
41	Vargas et al, 1955	F	—	3	Premature	Greater curvature	0	+	L
42	Vargas et al, 1955	M	—	7	Full term	Greater curvature	+	+	D
43	Vargas et al, 1955	M	—	3	Full term	Lesser curvature	0	+	L
44	Kiesewetter, 1956	M	N	2	Full term	Cardiac end of stomach along greater curvature	+	+	D
45	Kiesewetter, 1956	M	W	2	Full term	—	0	+	D
46	Kiesewetter, 1956	F	—	10	Full term	Greater curvature	+	0	D
47	Kiesewetter, 1956	F	W	1	Full term	Lesser curvature	0	+	D
48	Meyer II, 1957	M	N	3	Premature	Greater curvature	0	+	D
49	Meyer II, 1957	M	W	4	Full term	Greater curvature	0	+	D
50	Castleton, 1958	M	W	2	Full term	Posterior wall	+	+	L
51	Castleton, 1958	M	W	3	Full term	Greater curvature	0	+	D
52	Castleton, 1958	M	W	4	Full term	Greater curvature	0	+	D

+ = done, 0 = not done, — = not recorded.
D = died, L = survived.

The first patient apparently died of peritonitis and shock. The extent of peritoneal irritation and the amount of exudate and foreign material free in the peritoneal cavity in the first case was much greater than in the second case, reemphasizing the need for early surgery.

Of the 52 cases reviewed (table 1), it will be noted that rupture in 37 occurred on one or the other curvatures with the greater curvature predominating by 3:1. Laparotomy was performed on 4 of the first 20 cases without a survival. The first survival was reported in 1951 by Kellogg and others,[16] with 9 subsequent survivals.

The age of onset of symptoms ranges from 12 hours to 10 days, with the most frequent time of onset between 3 and 5 days. All survivals had an onset of symptoms under 5 days; all occurred in babies born in hospitals who had not been sent home and so were under close medical supervision. This again shows the importance of early diagnosis and prompt surgery in the successful treatment of this condition.

SUMMARY

We have reported 2 cases of spontaneous perforation of the stomach in premature siblings with 1 survival. We believe that the cause of perforation in these cases was a localized congenital deficiency of the muscular wall of the stomach. Since this condition is rare, the occurrence in siblings might suggest a genetic defect.

REFERENCES

A list of references may be obtained from the author.

Dr. Ozkaragoz, P. O. Box 6038, Corpus Christi.
Dr. Stewart, 123 Ogden Lane, San Antonio.

Simulated Dissecting Aneurysm

Case Report

LEONARD C. DOUBLEDAY, M.D.
Houston, Texas

AN ELDERLY WHITE MAN complaining of severe pain in the back was admitted to the hospital following abnormal findings in a routine examination of the chest (fig. 1a). A chest film made 2 weeks previously was available for comparison (fig. 1b).

A diagnosis of dissecting aneurysm based on the appearance of the thoracic aorta in a chest roentgenogram was changed when evidence of a recent compression fracture of the first lumbar vertebra but no dissection was noted in aortography.

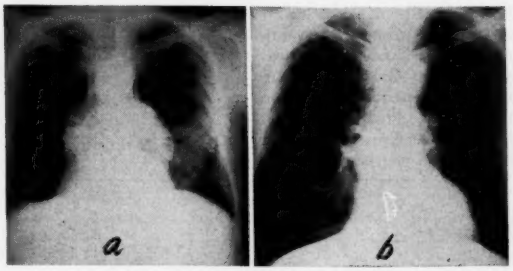


Fig. 1. Marked change in the appearance of the thoracic aorta **(a)** when compared with a chest film taken 2 weeks previously **(b)**.

Fig. 2a. Aortogram demonstrating tortuosity of the thoracic aorta but no evidence of dissection.
b. Recent compression fracture of the first lumbar vertebra.

Dr. Leonard C. Doubleday practices roentgenology.

Because there appeared to be a marked change in the appearance of the thoracic aorta in the second examination, a diagnosis of dissecting aneurysm was made and an aortogram (fig. 2a) was made.

The aortogram did not reveal evidence of dissection but rather marked tortuosity of the thoracic aorta.

In one of the lateral projections it was noted that there was evidence of a recent compression fracture of the body of the first lumbar vertebra (fig. 2b). Questioning of the patient's family disclosed that the patient had fallen a few days prior to admission.

COMMENT

The difference in the appearance of the aorta is explained on the basis of change in the conformation of the thoracic cage following the fracture of the spine. This change apparently caused increase in tortuosity of the arteriosclerotic thoracic aorta.

Dr. Doubleday, 1223 Memorial Professional Building, 1010 Louisiana, Houston 2.

Hemoglobin Synthesized

The hemoglobin of the red cells of the blood has been synthesized for the first time under "test tube" conditions, reports Richard S. Schweet, Ph.D., in an article on "Synthesis of Hemoglobin in a Cell-Free System" in the October issue of the *Proceedings* of the National Academy of Sciences.

A research biochemist at the City of Hope in California, Dr. Schweet extracted microsomes from immature red blood cells of laboratory animals. After adding 15 amino acids and leucine tagged with radioactive carbon, Dr. Schweet isolated radioactive hemoglobin from the test tube microsomes.

Tanning Substance Causes Dermatitis

A chromium salt used to tan leather has been found to cause skin eruptions on the feet, according to a report of Dr. George E. Morris, Boston, in the November issue of *Archives of Dermatology.*

Dr. Morris found 4 patients with shoe leather dermatitis who reacted positively to the chrome salt. In addition, 2 leather workers who previously had "chrome dermatitis" reacted positively to the material. Substances found in shoes, other than the chrome salt, which cause dermatitis include dyes, other chemicals in the leather, the material used in the box tops of shoes, and rubber adhesives.

The hula hoop is reported to be causing a classical clinical picture which Dr. J. O. Newman of Stevenage, England, describes.

Quoted in the January 14, 1959, *Medical News,* Dr. Newman calls attention to a woman of 68 with these symptoms who admitted "having a go" at young Willie's hoop: "Complaints of pain at the side of the neck associated with a pain in the upper abdomen. On examination there is a varying degree of reduced movement of the cervical spine; spasm and tenderness in one or both sternomastoids, the cervical portion of the trapezius and the paravertebral muscle in the cervical region."

★ Coming Meetings

Texas Medical Association, San Antonio, April 18-21, 1959. Dr. Howard O. Smith, Marlin, Pres.; Mr. C. Lincoln Williston, 1801 North Lamar Blvd., Austin, Exec. Secy.

American Medical Association, Atlantic City, June 8-12, 1959. Dr. Gunnar Gundersen, La Crosse, Wis., Pres.; Dr. F. J. L. Blasingame, 535 North Dearborn, Chicago 10, Exec. Vice-Pres.

Current Meetings

APRIL

American Academy of General Practice, San Francisco, April 6-9, 1959. Dr. Holland T. Jackson, Fort Worth, Pres.; Mr. Mac F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Executive Secy.

American Association for Thoracic Surgery, Los Angeles, April 21-23, 1959. Dr. Michael E. DeBakey, Houston, Pres.; Dr. Hiram T. Langston, 7730 Corondelet Ave., St. Louis 5, Secy.

American Association of Genito-Urinary Surgeons, Absecon, N. J., April 15-17, 1959. Dr. John A. Taylor, New York, Pres.; Dr. W. J. Engel, 2020 E. 93rd St., Cleveland 6, Secy.

American College of Obstetricians and Gynecologists, Atlantic City, April 5-9, 1959. Dr. R. Glen Craig, San Francisco, Pres.; Mr. Donald F. Richardson, 15 S. Clark St., Chicago 3, Executive Secy.

American College of Physicians, Chicago, April 20-24, 1959. Dr. Dwight L. Wilbur, San Francisco, Pres.; Mr. E. R. Loveland, 4200 Pine, Philadelphia 4, Secy.

American Psychiatric Association, Philadelphia, April 26-May 1, 1959. Dr. Francis J. Gerty, Chicago, Pres.; Dr. C. H. Hardin Branch, 156 Westminister Ave., Salt Lake City, Secy.

American Surgical Association, San Francisco, April 15-17, 1959. Dr. I. S. Ravdin, Philadelphia, Pres.; Dr. William Altemeier, Cincinnati General Hospital, Cincinnati 29, Secy.

American Urological Association, Atlantic City, April 20-23, 1959. Dr. Adolph Kutzmann, Los Angeles, Pres.; Dr. Samuel L. Raines, 188 S. Bellevue Blvd., Memphis, Tenn., Secy.

Association of American Physicians and Surgeons, Fort Worth, April 2-4, 1959. Dr. Mal Rumph, Fort Worth, Pres.; Mr. Harry E. Northam, 185 N. Wabash Ave., Chicago 1, Executive Secy.

Southwest Allergy Forum, Houston, April 26-28, 1959. Dr. Richard L. Etter, Houston, Pres.; Dr. Richard H. Jackson, 156 Hermann Professional Building, Houston, Secy.

Texas Air-Medics Association, San Antonio, April, 1959. Dr. R. Henry Harrison, Bryan, Pres.; Dr. C. F. Miller, P. O. Box 1338, Waco, Secy.

Texas Chapter, American Association of Public Health Physicians, San Antonio, April 19, 1959. Dr. David M. Cowgill, San Benito, Pres.; Dr. B. M. Primer, 2709 Rio Grande, Austin.

Texas Chapter, American College of Chest Physicians, San Antonio, April 19, 1959. Dr. J. O. Armstrong, Dallas, Pres.; Dr. Carlos J. Quintanilla,, Box 592, Harlingen, Secy.

Texas Dermatological Society, San Antonio, April 20, 1959. Dr. Earl L. Loftis, Dallas, Pres.; Dr. E. N. Walsh, 1410 Pruitt St., Fort Worth 4, Secy.

Texas Diabetes Association, San Antonio, April 19, 1959. Dr. Merton Minter, San Antonio, Pres.; Dr. Warren W. Moorman, 901 W. Leuda, Fort Worth, Secy.

Texas Heart Association, San Antonio, April 19, 1959. Dr. William B. Adamson, Abilene, Pres.; Ernest T. Guy, 404 Jesse H. Jones Library Bldg., Texas Medical Center, Houston 25, Executive Director.

Texas Industrial Medical Association, San Antonio, April 19, 1959. Dr. Wendell H. Hamrick, Houston, Pres.; Dr. Robert A. Wise, Box 2180, Houston, Secy.

Texas Neurophychiatric Association, San Antonio, April 19, 1959. Dr. Samuel R. Snodgrass, Galveston, Pres.; Dr. Clarence S. Hoekstra, 8215 Westchester Drive, Dallas, Secy.

Texas Ophthalmological Association, San Antonio, April 19, 1959. Dr. Harold Beasley, Fort Worth, Pres.; Dr. James Scruggs, 2223 Austin, Waco, Secy.

Texas Orthopedic Association, San Antonio, April 20, 1959. Dr. Louis J. Levy, Fort Worth, Pres.; Dr. Margaret Watkins, 3503 Fairmount, Dallas, Secy.

Texas Physical Medicine and Rehabilitation Society, San Antonio, April 19, 1959. Dr. Vann S. Taylor, Dallas, Pres.; Dr. Lewis A. Leavitt, Veterans Administration Hospital, Houston, Secy.

Texas Society of Anesthesiologists, San Antonio, April 19, 1959. Dr. M. M. Rosenzweig, San Antonio, Pres.; Dr. M. T. Jenkins, Parkland Hospital, Dallas, Secy.

Texas Society of Athletic Team Physicians, San Antonio, April 18, 1959. Dr. Edward T. Smith, Houston, Pres.; Dr. Jack Brannon, 2715 Fannin, Houston, Secy.

Texas Society of Gastroenterologists and Proctologists, San Antonio, April 19, 1959. Dr. O. P. Griffin, 800 5th Avenue, Fort Worth, Pres.; Dr. A. C. Broders, Jr., Scott and White Clinic Hospital, Temple, Secy.

Texas Society of Pathologists, Inc., San Antonio, April 20-21, 1959. Dr. Jarrett Williams, Abilene, Pres.; Dr. Sylvia Johns, 414 Navarro St., San Antonio, Secy.

Texas Society of Plastic Surgeons, San Antonio, April 18, 1959. Dr. Baron Hardy, Houston, Pres.; Dr. Raymond Brauer, 6615 Travis, Houston, Secy.

Texas Surgical Society, Austin, April 5-7, 1959. Dr. Albert Hartman, San Antonio, Pres.; Dr. G. V. Brindley, Jr., Scott and White Clinic, Temple, Secy.

Texas Traumatic Surgical Society, San Antonio, April 19, 1959. Dr. G. V. Brindley, Temple, Pres.; Dr. W. E. Crump, 1300 Eighth, Wichita Falls, Secy.

Third District Society, Plainview, April 4, 1959. Dr. Grady M. Wallace, Lubbock, Pres.; Dr. H. Fred Johnson, 2308 W. Eighth, Amarillo, Secy.

Texas State Board of Examiners in Basic Sciences, April, 1959. Henry B. Hardt, Ph.D., Fort Worth, Pres.; Mrs. Betty J. Anderson, Chief Clerk, 303 East Seventh, Austin.

MAY

American Gynecological Society, Hot Springs, Va., May 25-27, 1959. Dr. Lewis C. Scheffey, Philadelphia, Pres.; Dr. A. A. Marchetti, 3800 Reservoir Rd. N.W., Washington 7, D. C., Secy.

American Ophthalmological Society, Hot Springs, Va., May 28-30, 1959. Dr. Derrick Vail, Chicago, Pres.; Dr. M. C. Wheeler, 30 W. 59th, New York 19, Secy.

American Pediatric Society, Buck Hill Falls, Pa., May 6-8, 1959. Dr. Joseph Stokes, Jr., Philadelphia, Pres.; Dr. A. C. McGuinness, Room 1036, 2800 Quebec St., N.W., Washington 8, D. C., Secy.

National Tuberculosis Association, Chicago, May 24-29, 1959. Dr. Mario M. Fischer, New York, Pres.; Mrs. Wallace B. White, 1790 Broadway, New York 19, Secy.

Texas Hospital Association, Houston, May 11-14, 1959. Mr. W. P. Earngey, Jr., Fort Worth, Pres.; Mr. O. Ray Hurst, 2208 Main, Dallas, Executive Director.

National and Regional

American Academy of Allergy, Hollywood-by-the-Sea, Fla., Jan. 11-13, 1960. Dr. Francis C. Lowell, Boston, Pres.; Dr. Joseph Noah, 100 N. Euclid Ave., St. Louis 8, Mo., Secy.

American Academy of Dermatology and Syphilology, Chicago, Dec. 5-10, 1959. Dr. A. C. Cipollaro, New York, Pres.; Dr. Robert R. Kierland, Mayo Clinic, Rochester, Minn., Secy.

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 11-16, 1959. Dr. John H. Dunnington, New York, Pres.; Dr. W. L. Benedict, 15 Second St. S.W., Rochester, Minn., Secy.

American Academy of Pediatrics, Chicago, Oct. 5-8, 1959. Dr. James C. Overall, Nashville, Pres.; Dr. E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill., Executive Secy.

American Association for Maternal and Infant Health, 1960. Mr. Howard I. Wells, Jr., 116 S. Michigan Ave., Chicago 3, Executive Secy.

American Association of Obstetricians and Gynecologists, Hot Springs, Va., Sept. 10-12, 1959. Dr. Joe V. Meigs, Boston, Pres.; Dr. E. Stewart Taylor, University of Colorado School of Medicine, 4200 E. 9th, Denver, Secy. September meeting by invitation only.

American Cancer Society, New York, Oct. 28-29, 1959. Dr. Eugene P. Pendergrass, Philadelphia, Pres.; M. R. Runyon, 521 W. 57th, New York, Executive Vice-Pres.

American College of Allergists. Dr. Merle W. Moore, Portland, Ore., Pres.; Dr. M. Coleman Harris, 450 Sutter St., San Francisco, Secy.

American College of Chest Physicians, Atlantic City, June 3-7, 1959. Dr. Donald R. McKay, Buffalo, Pres.; Mr. Murray Kornfeld, 112 E. Chestnut, Chicago 11, Executive Secy.

American College of Gastroenterology, Los Angeles, Sept. 20-26, 1959. Dr. Frank L. Borrelli, New York, Pres.; Mr. Daniel Weiss, 33 West 60th, New York 23, Executive Director.

American College of Radiology, New Orleans, Feb. 3-6, 1960. Dr. Lawrence Reynolds, 10 Peterboro, Detroit, Pres.; Mr. W. C. Stronach, 20 N. Wacker Dr., Chicago 6, Executive Director.

American College of Surgeons, Atlantic City, Sept. 28-Oct. 2, 1959. Dr. Newell W. Philpott, Montreal, Pres.; Dr. Michael L. Mason, 40 E. Erie, Chicago 11, Secy.

American Congress of Physical Medicine and Rehabilitation, Minneapolis, Aug. 30-Sept. 4, 1959. Dr. Arthur C. Jones, Portland, Ore., Pres.; Dorothea C. Augustin, 30 N. Michigan Ave., Chicago 2, Executive Secy.

American Dermatological Association, Atlantic City, June 1-4, 1959. Dr. J. Lamar Callaway, Durham, N. C., Pres.; Dr. Wiley M. Sams, 25 Southeast 2nd Ave., Miami, Secy.

American Gastroenterological Association, Atlantic City, June 5-6, 1959. Dr. C. J. Barborka, Chicago, Pres.; Dr. F. J. Ingelfinger, 65 E. Newton, Boston 18, Secy.

American Heart Association, Philadelphia, Oct. 26-27, 1959. Dr. Francis L. Chamberlain, San Francisco, Pres.; Mr. William F. McGlone, 44 E. 23rd, New York 10, Secy.

American Hospital Association, New York, Aug. 24-27, 1959. Mr. Tol Terrell, San Angelo, Pres.; Dr. Edwin L. Crosby, 810 N. Lake Drive, Executive Director.

American Laryngological, Rhinological, and Otological Society. Dr. G. D. Hoople, Syracuse, N. Y., Pres.; Dr. C. S. Nash, 708 Medical Arts Bldg., Rochester, N. Y., Secy.

American Neurological Association, Atlantic City, June 15-17, 1959. Dr. Bernard J. Alpers, Philadelphia, Pres.; Dr. Charles Rupp, 133 S. 36th, Philadelphia 4, Secy.

American Orthopaedic Association, Lake Placid, N. Y., June 15-18, 1959. Dr. C. Leslie Mitchell, Detroit, Pres.; Dr. Lee Ramsay Straub, 535 East 70th St., New York 21, Secy.

American Proctologic Society, Atlantic City, June 15-18, 1959. Dr. Karl Zimmerman, Pittsburgh, Pres.; Dr. Norman D. Nigro, 10 Peterboro, Detroit 1, Secy.

American Public Health Association, Atlantic City, Oct. 19-23, 1959. Dr. Leona Baumgartner, New York, Pres.; Dr. Berwyn F. Mattison, 1790 Broadway, New York 19, Executive Secy.

American Society of Anesthesiologists, Bal Harbour, Fla., Oct. 5-9, 1959. Dr. Daniel C. Moore, Seattle, Pres.; Dr. J. E. Remlinger, Jr., 188 W. Randolph, Chicago 1, Secy.

American Society of Clinical Pathologists, Chicago, Sept. 7-11, 1959. Dr. Edward L. Burns, Toledo, Pres.; Mr. Claude E. Wells, 2052 N. Orleans, Chicago 14, Executive Secy.

International College of Surgeons, U. S. Chapter, Chicago, Sept. 13-17, 1959. Dr. Edward L. Compere, Chicago, Pres.; Mr. Ross T. McIntire, 1516 Lake Shore Dr., Chicago, Executive Director.

Radiological Society of North America, Chicago, Nov. 15-20, 1959. Dr. Lawrence L. Robbins, Boston, Pres.; Dr. Donald S. Childs, 713 E. Genesee, Syracuse 2, N.Y., Secy.

South Central Association of Blood Banks, Albuquerque, March or April, 1960. Dr. John B. Alsever, Phoenix, Pres.; L. Ruth Guy, Ph.D., Room 1101, Stoneleigh Hotel, Dallas, Secy.

Southern Medical Association, Atlanta, Ga., Nov. 16-19, 1959. Dr. Milford O. Rouse, Dallas, Pres.; Mr. V. O. Foster, 2601 Highland Avenue, Birmingham 5, Executive Secy.

Southern Psychiatric Association, Dallas, Oct. 4-6, 1959. Dr. J. L. Knapp, Dallas, Pres.; Dr. Richard Proctor, Winston-Salem, N. C., Secy.

Southern Surgical Association, Hot Springs, Va., Dec. 8-10, 1959. Dr. George C. Finney, Baltimore, Pres.; Dr. John D. Martin, Jr., Emory University, Ga., Secy.

Southwest Regional Cancer Conference, Fort Worth, Sept. 20, 1959. Dr. W. S. Lorimer, Jr., Fort Worth, Chm.; Mrs. Ira Frances Ball, 264 W. 11th, Fort Worth, Secy.

Southwestern Medical Association, Roswell, N. Mex., Oct.-Nov., 1959. Dr. A. R. Clausen, Albuquerque, Pres.; Dr. M. D. Thomas, 1501 Arizona St., 12-D, El Paso, Secy.

Southwestern Society of Nuclear Medicine. Dr. Herbert C. Allen, Jr., Houston, Pres.; Dr. J. R. Maxfield, Jr., 2711 Oak Lawn Avenue, Dallas, Secy.

Southwestern Surgical Congress. Dr. Fred H. Krock, Little Rock, Pres.; Mary O'Leary, 813 Medical Arts Bldg., Oklahoma City, Exec. Secy.

Tri-State Medical Assembly, Shreveport, La., Oct. 2-3, 1959. Dr. R. B. Langford, Shreveport, Pres.; Dr. J. W. Wilson, Jr., 940 Margaret Place, Shreveport, Secy.

United States-Mexico Border Public Health Association. Albert O. Irigoyen, Mexico, D.F., Pres.; Dr. Jorge Román, 243 United States Court House, El Paso, Secy.

State

Private Clinics and Hospitals Association of Texas. Dr. Jack S. Maxfield, Dallas, Pres.; Mr. Henry E. Taylor, Medical Arts Building, Dallas, Executive Secy.

Texas Academy of General Practice, Galveston, Oct. 4-7, 1959. Dr. Charles E. Oswalt, Jr., Fort Stockton, Pres.; Mr. Donald C. Jackson, 1905 N. Lamar, Austin, Executive Secy.

Texas Academy of Internal Medicine, San Antonio, Dec. 4-5, 1959. Dr. Merton M. Minter, San Antonio, Pres.; Dr. Hugo T. Engelhardt, 1216 Main, Houston, Secy. Meetings restricted to members.

Texas Association for Mental Health, Austin, 1960. Dr. Paul Southern, Abilene, Pres.; Mr. John Lane, 2410 San Antonio, Austin, Executive Director.

Texas Association of Obstetricians and Gynecologists, Austin, February, 1960. Dr. Maurice Meynier, Houston, Pres.; Dr. Hugh W. Savage, 815 Fifth Ave., Fort Worth, Secy.

Texas Club of Internists. Dr. D. D. Warren, Waco, Pres.; Dr. L. C. Carter, 2600 Procter, Port Arthur, Secy.

Texas Division, American Cancer Society, Austin, Dec., 1959. Dr. John A. Wall, Houston, Pres.; Mr. Curt W. Reimann, 5014 Bull Creek Rd., Austin 3, Executive Director.

Texas Pediatric Society, Houston, September or October, 1959. Dr. Bruce A. Knickerbocker, Dallas, Pres.; Dr. James N. Walker, 5216 W. Freeway, Fort Worth, Secy.

Texas Proctologic Society, Dallas, February, 1960. Dr. Alvin Baldwin, Dallas, Pres.; Dr. H. Gray Carter, 915 St. Joseph St., Dallas, Secy.

Texas Public Health Association. Dr. D. R. Reilly, San Angelo, Pres.; Mr. Joseph N. Murphy, Jr., Box 4012, Austin 51, Executive Secy.

Texas Radiological Society, Houston, January, 1960. Dr. Herman C. Sehested, Fort Worth, Pres.; Dr. R. P. O'Bannon, 1216 Pennsylvania, Fort Worth, Secy.

Texas Rheumatism Association, San Antonio, Dec. 4, 1959. Dr. Warren W. Moorman, Fort Worth, Pres.; Dr. J. Morris Horn, 3707 Gaston, Dallas, Secy.

Texas Society on Aging, Dallas, Oct. 16-17, 1959. Mr. Herbert Shore, Dallas, Pres.; Mrs. William B. Ruggles, 3701 Stratford, Dallas, Secy.-Treas.

Texas Society of Ophthalmology and Otolaryngology, Fort Worth, Dec. 4-5, 1959. Dr. James T. Robison, Austin, Pres.; Dr. Edwin G. Grafton, 4319 Oak Lawn, Dallas, Secy.

Texas Tuberculosis Association, Abilene, March, 1960. Mr. Zeb Rike, McAllen, Pres.; Miss Pansy Nichols, P. O. Box 6158, Austin 21, Executive Director.

Texas Urological Society, Waco, 1959. Dr. William Heck, San Antonio, Pres.; Dr. Moreton A. Magid, 1525 Colcord Ave., Waco, Secy.

District

First District Society. Dr. H. D. Garrett, El Paso, Pres.; Dr. E. S. Crossett, 1501 Arizona St., El Paso, Secy.

Second District Society, Lamesa. Dr. Oscar E. Rhode, Colorado City, Pres.; Dr. John H. Chinn, Jr., Colorado City, Secy.

Fourth District Society, San Angelo, May 16, 1959. Dr. W. L. Smith, San Angelo, Pres.; Dr. S. Braswell Locker, 1501 11th St., Brownwood, Secy.

Fifth and Sixth Districts Society, Corpus Christi, July 10-11, 1959. Dr. O. L. Riley, Corpus Christi, Pres.; Dr. Thelma Frank, 1314 16th St., Corpus Christi, Secy.

Seventh District Society. Dr. Robert N. Snider, Austin, Pres.; Dr. Richard Lucas, 502 W. 13, Austin, Secy.

Eighth District Society, Victoria. Dr. Joseph Magliolo, Dickinson, Pres.; Dr. M. Warren Hardwick, 829 E. Mulberry, Angleton, Secy.

Ninth District Society, Brenham, 1960. Dr. Haden E. McKay, Humble, Pres.; Dr. Lyman C. Blair, 1212 Rothwell, Houston, Secy.

Tenth District Society, Beaumont, 1959. Dr. Albert L. Delaney, Liberty, Pres.; Dr. Irving M. Richman, 3280 Fannin St., Beaumont, Secy.

Eleventh District Society, Palestine, Sept. 9, 1959. Dr. Ben Wilson, Tyler, Pres.; Dr. Phillip W. Taylor, 833 S. Beckham, Tyler, Secy.

Twelfth District Society, A&M College, July 4, 1959. Dr. Paul H. Mitchell, Corsicana, Pres.; Dr. J. M. Brown, Torbett Clinic, Marlin, Secy.

Thirteenth District Society. Dr. W. R. Sibley, Abilene, Pres.; Dr. R. D. Moreton, 1217 W. Cannon, Fort Worth, Secy.

Fifteenth District Society. Dr. Charles Wise, Naples, Pres.; Dr. George Bennett, 402 S. Bolivar, Marshall, Secy.

Clinics

Blackford Memorial Cancer Lectures, Denison, Nov. 3, 1959 (tentative). Dr. R. G. Gerard, 509 S. Mirick, Denison, Chm.

Dallas Southern Clinical Society, Dallas, March 21-23, 1960. Dr. T. Haynes Harvill, Dallas, Pres.; Millard J. Heath, 433 Medical Arts Bldg., Dallas 1, Executive Officer.

International Medical Assembly of Southwest Texas, San Antonio, Jan. 25-27, 1960. Dr. Alvin O. Severance, San Antonio, Pres.; S. E. Cockrell, 202 W. French Place, San Antonio, Exec. Secy.

New Orleans Graduate Medical Assembly. Dr. Jo Weilbaecher, New Orleans, Pres.; Dr. Maurice E. St. Martin, 1430 Tulane Ave., New Orleans 12, Secy.

North Texas-Southern Oklahoma Fall Clinical Conference. Dr. Frank J. Lee, 1300 8th, Wichita Falls, Chm.

Oklahoma City Clinical Society Conference, Oklahoma City, Oct. 26-28, 1959. Dr. Ralph A. Smith, Oklahoma City, Pres.; Miss Alma F. O'Donnell, 503 Medical Arts Bldg., Oklahoma City 2, Executive Secy.

Postgraduate Medical Assembly of South Texas, Houston, July 20-22, 1959. Dr. Herbert H. Harris, Houston, Pres.; Dr. C. Forrest Jorns, Secy., Exec. Office, 412 Jesse Jones Library Bldg., Houston 25.

Board Examinations

Texas State Board of Medical Examiners, Fort Worth, June 22-24, 1959. Dr. M. H. Crabb, Fort Worth, Secy.; Mrs. Luanna Reddin, 1714 Medical Arts Bldg., Fort Worth, Assistant Secy.

MEDICOLEGAL NOTES

Major Problem of Physicians: Should Records Be Stored?

Physicians constantly are faced with the problem of what to do with medical records—should they be destroyed or stored and if they may be destroyed, when is it safe to do so? The following questions are typical of those asked by physicians in regard to medical records:

"How long are we required by law to keep original x-rays?"

"Are microfilms legally acceptable as a substitute for original x-ray films or medical records?"

"How long should microscopic slides prepared from tissue specimens be maintained? Should they be filed indefinitely?"

"Should I destroy tissue specimen reports or are they part of the medical record?"

"Nurses' notes are space consuming. Are they part of the medical record or can they be destroyed?"

"What about paraffin blocks, temperature sheets, and electrocardiogram tracings?"

As can be seen from these questions, there are basically two distinct points which the physicians are desiring to have clarified: (1) What is to be considered as a part of the medical record? (2) How long should the medical record be kept?

The following points should be beneficial in answering these questions.

1. It has been said that "a medical record is the compilation of the pertinent facts of the patient's life history, his illness, and treatment. In a larger sense the medical record is a compilation of scientific data derived from many sources, coordinated into a document and available for various uses, personal and impersonal, to serve the patient, the physician, the institution in which the patient has been treated, the science of medicine, and society as a whole."*

This definition of medical records seems to indicate clearly that all information, be it history, x-rays, tissue reports, nurses' notes, and the like, accumulated pursuant to the care and treatment rendered a patient is to be considered a part of the medical record.

2. In light of legislative enactments in recent years, it would appear to be acceptable to microfilm such portions of the medical records as are capable of being microfilmed, and such microfilms properly identified would be admissible in court in lieu of the original records. However, if litigation is pending or has been threatened, it would be wise to retain the originals if they are still available until the matter has been resolved.

3. These medical records are invaluable in the event the patient subsequently should sue the physician for malpractice. Consequently, from a legal standpoint, I believe that the physician should retain all of the medical record until such time as any action for malpractice is barred by the statute of limitations.

4. In Texas the statute of limitations, as pertains to actions for malpractice, requires that the suit be brought within 2 years of the date of the allegedly negligent act complained of or the action is thereafter barred.

5. There is one important exception which must be considered in regard to the statute of limitations, and that concerns cases involving minors. The statute of limitations does not commence to run against a minor until he reaches the age of 21.

6. From a legal standpoint, I recommend that physicians maintain the complete medical record of adults for a period of not less than 2 years. When a minor is involved, the complete medical record should be kept for a minimum of 2 years after the minor has reached his twenty-first birthday.

7. If a suit has been threatened or is pending, the complete medical record should be kept until the issue is finally resolved regardless of whether it is felt that the statute of limitations will act as a bar to the case. Use of the medical records may be necessary to establish that the statute of limitations in fact has barred the action.

8. Aside from the legal aspects involved, the physician of course should retain the medical record so long as there is scientific, historical, or teaching value to such record or so long as the patient might have further need of it, for example, if a patient is moving from one city to another and asking that his record be forwarded to his family physician at his new residence.

PHILIP R. OVERTON, LL.B., Austin.

*Emanuel Hayt, Lillian R. Hayt, and August H. Groeschel: Law of Hospital, Physician and Patient, New York, Hospital Textbook Company, 1952.

Legislative Action Still Pends On Health Related Bills

Texas physicians and other persons particularly interested in health bills or related legislation will be keeping a close watch on action of both houses of the Texas Legislature in weeks to come.

A complete list of such bills appeared in the March issue of the *Texas State Journal of Medicine*. At press time for the April issue, the picture on some of the bills looked like this:

H. B. 204-S.B. 121, which would require licensing of all hospitals in Texas with exception of nursing homes, private mental hospitals, and certain federal and state hospitals, had been reported favorably by the Public Health Committees of both House and Senate.

Supported by both the Texas Medical Association and the Texas Hospital Association, such licensing would not affect management or staffs of hospitals, but would emphasize safety, fire prevention, and sanitation. The license fee, both initially and annually, would be $1 per bed with a minimum of $25 for hospitals with less than 25 beds; a maximum of $500 for those with more than 500 beds. Licensing would be under the State Board of Health. Texas

is one of only three states which do not have such licensing laws already.

S.B. 151-H.B. 487, pertaining to the administration, dispensing, and selling at retail of exempt narcotics, was reported favorably by the Senate Jurisprudence Committee and the House Public Health Committee in March. This bill attempts to eliminate outlets like pool halls and filling stations from qualifying to handle these exempt narcotics for resale and places these drugs under professional control. It also provides a penalty for using a minor as an agent. Pharmacists could sell these drugs without prescription, but would be limited as to amount to be sold to one person within a 48 hour period. This is one of several bills strengthening Texas narcotics laws which are under consideration.

On March 31, *H.B. 421,* which would recodify completely the Texas tuberculosis statutes, was approved by the House Committee on State Hospitals and Special Schools. It pertains not only to the care and treatment of persons afflicted with tuberculosis, but also to the care of the tuberculous indigent and the person who refuses care and treatment.

H.B. 264, designed to permit donation and bequest of human bodies and organs, passed both houses and was on its way to the Governor. Known as "the tissue bill," it will allow persons to give their bodies, or parts thereof, by will or simple written instrument for medical research or for replacement or rehabilitation of diseased or wornout organs of living humans.

The House passed *H.B. 9,* which would establish a new medical school in Bexar County, on March 20. Its companion bill is S.B. 13.

Still pending in a subcommittee of the Senate was *S.B. 28,* which is supported by the Texas Medical Association. This bill would create a state medical examiner commission, a chief medical examiner, and appointed regional medical examiners upon requests of commissioners' courts.

H.B. 42, pertaining to certification of psychologists, was still pending in the State Affairs Committee of the House, where it was set for a hearing April 7. This bill is similar to one submitted at the last regular session and is opposed by the Texas Medical Association Council on Medical Jurisprudence on the basis that it represents another inroad into the private practice of medicine.

H.B. 213 would permit nonprofit corporations and associations to employ physicians on a salary, commission, or other basis of compensation. If enacted, the corporation could receive fees, charges, and reimbursements for the doctor's services. The Council on Medical Jurisprudence points out that corporations, as such, lack the qualifications necessary for a license, and their activities become illegal without a license. It also should be noted that, at present, physicians violate state laws if they accept employment to practice medicine for an individual, firm, or corporation not duly licensed to practice medicine. If H.B. 213 is passed, it would authorize corporate practice and "third party" or panel medicine. The bill currently is in committee.

S.B. 273, an amended bill replacing H.B. 37 and S.B. 196, was introduced March 4. It is the enabling legislation for the constitutional amendment approved by the voters of Texas last November pertaining to needy recipients of old age assistance, aid to the blind, aid to dependent children, and aid to the permanently and totally disabled. Amending Section 12 is in regard to certification by physicians for need of medical care. The Texas Medical Association Council on Medical Jurisprudence had taken no action for or against the bill.

Keogh-Simpson Bill Making Progress

The Keogh-Simpson bill, which would permit the self-employed to defer taxes on as much as 10 per cent of adjusted gross income up to $2,500 a year provided the money is placed in retirement plans, was passed in the United States House of Representatives with surprising ease during March, the American Medical Association's Washington staff reports. Only about 20 lawmakers of more than 200 on the floor voted "no" on the voice vote tally.

The bill at this time is receiving consideration in the Senate, where it is anticipated more opposition will be met than was true in the House. The big question in the Senate is whether backers will push for hearings this year or wait until the next session, when the budget issue may be more settled. There are almost two entire sessions for consideration of the measure in the Senate. The American Medical Association officials recommend that Texas physicians interested in passage of the measure write now to Senators Lyndon Johnson and Ralph Yarborough, expressing their opinions.

Regression in Epilepsy Law Seen

"Epilepsy and Texas Law" are discussed by Dr. Alex Newman of Jefferson Davis Hospital, Houston, in the spring, 1958, issue of the *South Texas Law Journal.*

A 1957 Texas Supreme Court decision, in the case of Texas Prudential Insurance Company versus Dillard, "appears to have taken judicial notice that epilepsy will breach the 'good health' provision of an insurance policy," Dr. Newman writes. "This decision was made in spite of undisputed medical or expert testimony offered to the effect that the insured, though afflicted with epilepsy, the clinical manifestations of which were controlled by medication, was, in fact, 'in sound health for all purposes,'" he continues, pointing out that the court has proceeded further in its medical analysis and has implied that epilepsy, though controlled, represents a serious threat to life.

The three major types of epilepsy are categorized in the evidence, Dr. Newman's article states, but the court fails to make a distinction between the milder and most severe forms, leading to the assumption that the decision applies to all three forms.

"This decision comes as a great surprise at this time and represents a definite regression in the light of modern medical progress, which, in the control of epileptic seizures, has rendered antiquated the epilepsy laws in most of the states."

Texas Ranks High In Hill-Burton Program

Texas ranks third among the states in having 182 projects in operation or under construction under the Hill-Burton program as of December, 1958, according to the Public Health Service. The total number of projects approved in the past 12 years was 4,315, with an estimated cost of $3,642,634,800 and United States share of $1,126,007,345. Of these, 3,993 projects are in operation or under construction, encompassing 170,040 beds, 1,073 health units and miscellaneous facilities. Other than Texas, states with the most projects are North Carolina with 283, Georgia with 234, and California with 174.

MEDICAL MEETINGS

West Texas Tumor Conference Set for San Angelo May 16

The West Texas Tumor Conference, sponsored jointly by the Tom Green-Eight County Medical Society and the Texas Division of the American Cancer Society, will be held May 16 in San Angelo.

All Texas physicians are invited to attend the 9 a. m.-5 p. m. session at the Town House Hotel, although West Texas doctors will receive special reservation cards by mail.

Three outstanding speakers will address the conference. Dr. Arthur Purdy Stout, chairman of the Department of Surgical Pathology at Columbia University, College of Physicians and Surgeons, New York, will speak on "Soft Tissue Tumors" and on "Relationship of Benign Tumors of the Breast to Cancer." He also will be after-dinner speaker for a banquet attended by physicians and their wives.

Dr. Clifton D. Howe, chief of clinics of the M. D. Anderson Hospital and Tumor Institute, Houston, will speak on "The Chemotherapy of Cancer" and "Viruses in Cancer."

"Early Diagnosis in Colon Lesions" and "Combination Chemotherapy and Surgery in the Treatment of Colon Tumors" will be the topics of Dr. Gerald Owen McDonald, assistant professor of surgery, University of Illinois College of Medicine, Chicago.

Reservations may be made by writing the program chairman, Dr. Tom Hunter, at the Clinic-Hospital of San Angelo, 224-234 West Beauregard Avenue, San Angelo.

Medical Assistants Slate May 8-10 Convention

The Texas Medical Assistants Association will hold its state convention in Austin May 8-10, with headquarters at the Stephen F. Austin Hotel. Doctors and other interested persons are invited to attend, though only members will have voting privileges. The registration fee of $10 includes both business and social sessions.

The convention will open at 8 a. m. May 8 with a workshop for local and state officers, followed by an executive committee meeting.

Saturday sessions will include an organizational meeting for new county groups and nominating and constitution and by-laws committee meetings.

Speakers during the general business session will include Austin Mayor Tom Miller; Roy Cates, executive secretary of the Travis County Medical Society; Mrs. LeNell Knebel, president of the Travis County Medical Assistants group; Mrs. Mary Ruth Ashmore of San Antonio, president of the Texas Medical Assistants Association. Past and present county presidents will be honored at a style show luncheon, after which the House of Delegates will meet.

Dr. F. S. Bambace of San Antonio will moderate a Saturday afternoon educational forum. Speakers will include Dr. Howard O. Smith of Marlin, retiring president of the Texas Medical Association; Dr. Albert A. Tisdale, Austin orthopedic surgeon; Dr. William F. McLean, Austin gynecologist; attorney Pat Bailey of Austin; Dr. George Tipton, Austin surgeon; and Charles T. Lux of Austin, executive vice-president of Associated Credit Bureaus of Texas.

C. Lincoln Williston, executive secretary of the Texas Medical Association, will be chief speaker at the Saturday night installation banquet, at which Mrs. Lucille Swearingen of Bartlesville, Okla., president of the American Association of Medical Assistants, will preside.

On Sunday morning, the group will be taken on a tour of Austin, including a stop for coffee at the Texas Medical Association headquarters building as guests of Mr. Williston and the staff.

The American Association of Medical Assistants was organized in Milwaukee in October, 1956, and the Texas Medical Assistants Association followed in February, 1957. Membership in the latter group is open to any person who has been employed for as much as one year as a medical assistant by members of the Texas Medical Association. The American Medical Association has approved the activities of the national group, whose objectives parallel those of the medical profession. The Committee on Patient Care of the Texas Medical Association has endorsed the objectives of the state and local groups here, and five Texas physicians serve as an advisory board for the state organization.

Chapters now exist in Harris, East Harris, Bexar, Travis, Lubbock-Crosby, Galveston, McLennan, Dallas, Tarrant, and Tom Green-Coke-Crockett-Concho-Irion-Sterling-Sutton-Schleicher Counties. National, state, and local dues are $5 each.

Mrs. Avadne Tramp of Austin is convention program chairman.

Andujar Honored by Award At Public Health Convention

At the thirty-fourth annual meeting of the Texas Public Health Association held February 22-25 in San Antonio, Dr. John J. Andujar of Fort Worth was recipient of the Bryant Award, given to the person who has contributed the greatest advancement to public health the preceding year. He founded a new test for syphilis.

Dr. Howard O. Smith of Marlin, President of the Texas Medical Association, spoke on "The Texas Medical Association and the Texas Public Health Association: A Team for Public Health" during the meeting. Other Texas Medical Association participants included Dr. J. E. Peavy, Austin; Dr. Carl F. Moore, Jr., Austin; Dr. Fred K. Laurentz, Houston; Dr. E. S. Irvine and Dr. E. W. Irvine, Wichita Falls; Dr. Austin E. Hill, Houston; Dr. D. R. Reilly, San Angelo; Dr. W. V. Bradshaw, Fort Worth; Dr. Roy G. Reed, Victoria; Dr. Carl A. Nau, Galveston; and Dr. Moss M. Dorbandt, San Antonio. Also on the program was Dr. Leona Baumgartner, president of the American Public Health Association, New York.

New officers of the Association are president, John T. Warren, Austin; president-elect, Mrs. Maggie Belle Davis, Corpus Christi; first vice-president, Reuben D. Wende, Houston; second vice-president, Kenneth T. Crane, San Antonio; and executive secretary, Joseph N. Murphy, Jr., Austin.

The 1960 meeting of the organization will be held in Galveston, February 21-24.

Dr. Allen Heads Nuclear Meeting

The fourth annual meeting of the Southwestern Society of Nuclear Medicine was held in the Roosevelt Hotel, New Orleans, March 14-15, under the presidency of Dr. Herbert C. Allen Jr. of Houston. Dr. Allen moderated one of the program panels, a symposium on scintillation scanning.

Texas Hospital Convention Will be Held May 11-14

The Texas Hospital Association is getting ready for its convention, May 11-14 at the Shamrock Hilton in Houston.

The session will be opened on Tuesday with a speech on "The Shape of Things to Come." Sectional meetings Wednesday will be composed of the following topics: "The Advantages of a Hospital Auxiliary to the Modern Hospital—Large and Small"; "Staffing Your Hospital"; "Progressive Care—Its Blessings and Pitfalls"; and "Problems of Staphylococcus Infections"; "Nursing—Quo Vadis (Whither Goest Thou?)."

"Your Hospital and the Law," topic of the Thursday session, will run concurrently with the House of Delegates meeting. President of the American College of Hospital Administrators, Anthony W. Eckert, will speak on the "Problems of Prepayment" and the past president will speak on "The Problems of Rising Hospital Costs." The annual banquet and dance will climax the convention.

Medicine, Vacation to Meet In Honolulu and Ship

The University of Southern California School of Medicine will offer its second annual postgraduate refresher course in Honolulu and on board the S. S. Lurline from July 29 through August 15.

The course is arranged so each physician may select topics which best suit his needs; emphasis is on practical diagnosis and treatment. In addition to didactic lectures, there will be workshops in radiologic and electrocardiographic interpretations, as well as in the diagnosis of jaundice and water and electrolyte balance. Tuition is $125 for complete course on island and ship, $100 for island portion only.

Further information is available from Dr. Phil R. Manning, director of the postgraduate division of the school, 2025 Zonal Avenue, Los Angeles 33.

Foreign Doctors to Attend Mental Retardation Conference

The first International Medical Conference on Mental Retardation will be held at the Eastland Hotel in Portland, Maine, July 27-31, a time particularly convenient for physicians returning from the International Pediatric Congress in Montreal, Canada, just previous.

Participating on the program will be physicians from the United States, England, Germany, Austria, and France. Facilities for simultaneous interpretation from, and into, other languages will be available for all general sessions.

Chest Physicians Slate 25th Anniversary

When the American College of Chest Physicians holds its silver anniversary meeting in Atlantic City June 3-7, it will publish a history of the growth of the organization since its first meeting in 1935. The scientific program will include speakers on all aspects of heart and lung diseases, and a number of doctors from foreign countries are expected to attend.

Examinations for fellowship in the College will be held on June 4.

Southwest Allergy Forum April 26-28

The Southwest Allergy Forum will hold its twentieth annual meeting April 26-28 at the Shamrock Hilton Hotel in Houston.

Texans on the program include Dr. Richard L. Etter, Houston, forum president; Dr. Donald M. Gready, Houston, president of the Harris County Medical Society; Dr. Boen Swinny, San Antonio; Boen Swinny, Jr., Galveston; and Dr. Salmon R. Halpern, Dallas.

Also Dr. S. H. Jaros, Harlingen; Dr. William C. Grater, Dallas; Dr. T. S. Painter, Jr., Austin; Dr. Albert H. Unger, El Paso; Dr. David M. Earl, Houston; Dr. Wilson G. Brown, Houston; Dr. J. M. Robison, Houston; Capt. Hans Pollack and Capt. Robert E. Smith, Lackland Air Force Base USAF Hospital; and Dr. Bernard T. Fine, San Antonio.

Chairmen of the various sessions include Dr. James R. Holman, Dallas; Dr. Clyde F. Elkins, Lubbock; Dr. Alan G. Cazort, Little Rock; Dr. Ethan Allan Brown, London, England; and Dr. W. H. Browning, Shreveport.

Occupational Health Congress

The thirteenth International Congress on Occupational Health, first to be held in the Western Hemisphere, will be convened in New York July 25-29, 1960, with Dr. Leo Wade of New York as chairman of the organizing committee. The congresses are sponsored by the Permanent Committee and International Association on Occupational Health.

Submission of papers for presentation at the congress are being invited. Further information may be requested from Dr. Irving R. Tabershaw, chairman of the Scientific Program Committee, International Congress on Occupational Health, 375 Park Avenue, New York.

Surgeons to Tour Even Russia

The International College of Surgeons has slated a midsummer postgraduate tour of Europe, which will give American members an opportunity to meet many of their fellow physicians abroad.

All major countries in Europe are included, and tour participants will attend the International College of Surgeons meeting in Amsterdam July 25-26, another in Helsinki August 8-9, and a third in Vienna August 19-20. Leningrad and Moscow are included on the itinerary. Those going by ship will leave New York on July 17, those who will fly, on July 24.

Further information is available from Dr. Ross T. McIntire, executive director of the international college, 1516 Lake Shore Drive, Chicago 10.

Oregon Dates Texas Speakers

An Oregon Cancer Conference is being held July 16-17 in Portland, under joint sponsorship of the Oregon State Medical Society, Oregon Division of the American Cancer Society, University of Oregon Medical School, and Oregon Academy of General Practice. The meeting is planned for midsummer as a special feature of the Oregon Centennial celebration.

Laws Governing Medical Research To Be Reviewed at May Conference

The first National Conference on the Legal Environment of Medical Science will be held May 27-28 at the University of Chicago under sponsorship of the National Society for Medical Research. The conference will attempt to reach agreements on ethical standards for the experimental use of human volunteers, cadavers, and laboratory animals and to develop principles for a model legal code to govern research in medicine.

Participants will include scientists, legal scholars, religious leaders, and representatives of various groups affected by differing practice, decisions, and laws. Inquiries relating to the conference may be addressed to the National Society for Medical Research, 920 S. Michigan Avenue, Chicago 5.

Nuclear Medicine Participants Invited

The Society of Nuclear Medicine will hold its sixth annual meeting June 18-20 at the Palmer House in Chicago. Persons interested in participating in the scientific program should submit titles and abstracts, of no more than 250 words, to Dr. Donald W. Petit, program chairman, University of Southern California, School of Medicine, 1200 North State Street, Los Angeles 33. This should be done no later than March 1.

Members and guests wishing to prepare scientific exhibits should prepare a report of about 500 words in explanation. Exact dimensions and other pertinent details should be forwarded to Dr. Murray E. Volk, chairman, committee on scientific exhibits, 5412 North Clark, Chicago, by March 1.

X-Ray Technicians Meet

The Texas Society of X-Ray Technicians is holding its twenty-ninth annual convention in the Robert Driscoll Hotel of Corpus Christi April 23-25. Master of ceremonies for the annual convention banquet is Dr. Y. C. Smith, Corpus Christi plastic surgeon.

Teachers of refresher courses include Drs. Leslie Moyers Garrett, Harrell Ray Arnold, and Paul H. Goodman, all of Corpus Christi.

EDUCATION

Postgraduate Courses

Allergy, New York, April 10-May 29.—The Postgraduate Medical School of the New York University-Bellevue Medical Center offers this part-time course of eight sessions, 1:30 to 3:30 p. m., Fridays only, April 10 through May 29. It consists of a discussion of fundamentals of allergy, together with description of diagnosis and treatment of its various clinical forms and demonstration of cases. Dr. Abner M. Fuchs is director. Additional information is available from the Associate Dean of the school, 550 First Avenue, New York 16.

Fractures, Houston, May 5, 12, and 19.—The University of Texas Postgraduate School of Medicine is sponsoring three courses on fractures at the Texas Medical Center in the University of Texas M. D. Anderson Hospital and Tumor Institute May 5, 12, and 19 at 7 to 10 p. m. Fractures of the Upper Extremities and the Spine will be taught by Dr. R. H. Eppright, May 5; Fractures of the Lower Extremities and Hip and Pelvis by Dr. Frank F. Parrish, May 12; and Childhood Fractures by Dr. Michael M. Donovan, May 19.

Medical Use of Radioisotopes, Houston, May 4-29.—The University of Texas Postgraduate School of Medicine will present this 4-week course at the University of Texas M. D. Anderson Hospital and Tumor Institute. It will be held Mondays through Fridays, 8 a. m. until 5 p. m. Tuition: $100. The course will deal with both physical aspects and the practical clinical applications of radioisotopes. About equal time will be devoted to each aspect, and both lectures and practical instruction will be offered in each.

Fractures, Houston, May 5-19.—The University of Texas Postgraduate School of Medicine will sponsor this course, a review of current trends in orthopedics, at the University of Texas M. D. Anderson Hospital and Tumor Institute. It will be conducted for 3 hours each Tuesday. Tuition: $20.

Diagnosis and Treatment of Thyroid Diseases, Oklahoma City, May 8-9.—This is the fifth annual surgery, radiology, and pathology symposium sponsored by the Office of Postgraduate Education, University of Oklahoma Medical Center, together with the Oklahoma Association of Pathologists, Oklahoma State Radiological Society, and the Oklahoma Chapter of the American College of Surgeons. Registration fee: $20; complimentary registration granted for interns, residents, and physicians in military service. Further information is available from the Office of Postgraduate Education at the medical center, 801 Northeast 13th Street, Oklahoma City 4.

Cardiac Arrhythmias, Philadelphia, May 22-24.—The American College of Physicians will present this course at the Philadelphia General Hospital, Mills Building auditorium. Director is Dr. Samuel Bellet. Minimal registration is 75; maximal, 125. Fee for college members is $30; for nonmembers, $60. Designed especially for internists and cardiologists, this course aims to cover the present status of cardiac arrhythmias from the standpoint of pathologic physiology, electrocardiography, and the clinical aspects. For further information, physicians may write the American College of Physicians, 4200 Pine Street, Philadelphia 4.

Rehabilitation of the Laryngectomee, Houston, June.—The University of Texas Postgraduate School of Medicine has not set a definite date for this 2-week course, which will be conducted Mondays through Fridays from 9 a. m. until 5 p. m. It will be taught at the University of Texas M. D. Anderson Hospital and Tumor Institute. There is no tuition fee. The course will cover vocational adjustment, anatomy of the speech mechanism, normal speech and voice production, esophageal speech and voice, laryngeal surgery, radiation therapy, facts about cancer, and techniques in teaching esophageal speech. The general presentation will combine both clinical and didactic approaches. It is designed for physicians, graduate nurses, speech therapists, laryngectomees with adequate speech and a university degree, graduate psychologists, and vocational counselors.

Psychiatry for the Internist, Baltimore, June 1-5.—The facilities of the Psychiatric Institute and the General Hospital of the University of Maryland School of Medicine will be used for this course, presented by the American College of Physicians. Patients to be studied will be chosen from the medical halls of the University Hospital. Director is Dr. Leo H. Bartemeier; co-director, Dr. Ephraim T. Lisansky. Maximum registration is 40. Tuition fees are $60 for college members; $80 for nonmembers.

Tuberculosis and Other Pulmonary Diseases, New York, June 8-26.—The Trudeau School of Tuberculosis and Other Pulmonary Diseases will hold its forty-fourth session at Saranac Lake, with this annual postgraduate course conducted under the auspices of the Trudeau Foundation and supported by the Hyde Foundation. Tuition is $100. Enrollment is limited and applications should be made early; a few scholarships are available for those who qualify. Inquiries may be made of the secretary, Trudeau School, Box 500, Saranac Lake.

Special Topics in Internal Medicine, Denver, June 15-19.—The American College of Physicians will present this postgraduate course at the University of Colorado School of Medicine, with Drs. Gordon Meiklejohn and C. Wesley Eisele as co-directors. Minimal registration is 25; maximal, 125. Fee for college members is $30; for nonmembers, $60. The course is divided into 10 half-day symposiums in major subdivisions of internal medicine. Lectures and panel discussions will be supplemented by presentations of clinical material whenever possible.

Southwestern Dedicates Clinical Science Building

Formal dedication ceremonies for the recently completed Clinical Science Building of Southwestern Medical School in Dallas were held April 16, an occasion emphasizing the progress of this youngest member of the University of Texas family.

The addition of the new eight story, glass and stone Clinical Science Building, which cost $3,500,000, to its 4 year old companion, the $2,850,000 Basic Science Building, provides Southwestern Medical School with a physical plant which boosts it to among the first 16 or 17 of the nation's 84 medical schools.

Southwestern stands on a 50-acre site in North Dallas across from its chief teaching hospital, Parkland Memorial, to which it is connected by a tunnel. It was founded in 1943 by the Southwestern Medical Foundation, a group of public spirited Dallasites, to fill the gap left by the move of Baylor University College of Medicine to Houston, and was operated for 6 years as Southwestern Medical College.

An aerial view of the growing Southwestern Medical Center in Dallas reveals Parkland Memorial Hospital in the center, with the just-dedicated Clinical Science Building of Southwestern Medical School of the University of Texas rising at the right, directly behind the smaller Basic Science Building of the school. More than $20,000,000 has already been invested in land and buildings of the center by the Medical School and Parkland Memorial Hospital.

From 1943 until 1955, the school was housed in wooden buildings typical of those which dotted numerous American campuses during World War II and immediately thereafter.

Joining the University of Texas fold in 1949, it began its physical plant improvement in 1955 and is, with its newest building, in an even better position to make the most of its $2,000,000 a year operation.

Southwestern has graduated some 1,000 physicians through the years, and has had the continuing support of the Southwestern Medical Foundation for faculty salary supplements, research grants, student loans, and similar vital financial aids. Its dean is Dr. A. J. Gill, Duke University-trained pathologist.

University of Texas Medical Branch

Dr. Francis Camps, Queen's Coroner of London, England, gave a special lecture on "Forensic Pathology" at the University of Texas Medical Branch, Galveston, on March 3.

Another recent guest lecturer was Dr. C. Allen Good, Rochester, Minn., head of the section of diagnostic roentgenology, Mayo Clinic, and professor of radiology at the graduate school, University of Minnesota, who discussed "Facts and Figures Which Influence the Treatment of Solitary Pulmonary Nodules."

Dr. Carl Nau, professor and chairman of the Department of Preventive Medicine and Public Health at the Medical Branch, has been named president of the Galveston Community Council. Also elected to the board was Dr. William C. Levin.

Two Medical Branch scientists are among 32 selected from throughout the United States to share in a new $500,000 appropriation for scientific research sponsored by the Tobacco Industry Research Committee. C. M. Pomerat, Ph.D., professor of cytology, received a portion of the new appropriation for "studying the culture of human lung tissue and the effects of known and possible carcinogenic agents upon such tissue." Dr. R. H. Rigdon, professor of pathology and director of the Laboratory of Experimental Pathology, received funds for his work on "effects of tobacco smoke condensate on the respiratory tract and other tissues of the duck."

Dr. James V. Warren, chairman of the Department of Medicine, was the Mr. and Mrs. J. N. Taub guest lecturer for 1959 for the Department of Internal Medicine at the Baylor University College of Medicine in Houston.

Two Medical Branch staff members were featured on the program of the National Association of Operating Room Nurses' sixth annual congress held in Houston February 9-12. They were Dr. Truman G. Blocker, professor and chairman of the Department of Plastic and Maxillofacial Surgery, and Miss Elizabeth Saunders, operating room supervisor.

The University of Texas board of regents announced a number of important changes and appointments for the University of Texas Medical Branch as of March 26, primarily establishing one of the final phases of a long range plan to give the School of Medicine a separate identity such as that long held by the School of Nursing.

Dr. Kenneth Earle, associate professor of pathology and director of the training program in neuropathology, was named dean of the School of of Medicine.

The post left vacant by the promotion of Dr. Earle was filled by Warren G. Harding, registrar and instructor in the Department of Preventive Medicine and Public Health,

who now, in addition to his assistant deanship, will be director of admissions.

Daniel J. Bobbitt was named director of hosiptals, filling a vacancy created by the resignation of Arthur G. Hennings, who had held the position for 1 year. Mr. Bobbitt had been a former acting director and assistant director.

E. Donald Walker, business manager, was given the added position of comptroller for fiscal affairs, and Dr. Edwin G. Troutman was named director of the newly established office of planning in regard to his work as coordinator of the preparatory studies and in addition to his duties as medical director of the outpatient department.

The regents approved the recommendation of Dr. Frank Connally, assistant executive director, that his office be abolished. Graduate of the Medical Branch and a former mayor of Waco, Dr. Connally planned to begin a 3 month position with M. D. Anderson Hospital and Tumor Institute in Houston as of April 1.

Public Health Service Offers Training

Opportunities for advanced study and research training are being offered by the Public Health Service under the direction of the National Institute of Neurological Diseases and Blindness. These awards are for 1 to 3 years of training at 48 institutions in the United States and 16 institutions in seven foreign countries. Stipends may range from $6,500 to $17,500 a year.

To qualify for an award, candidates should have a doctor of medicine or doctor of philosophy degree and at least 3 years of training or experience pertinent to the training for which he seeks support. Requests for complete information and application forms should be addressed to Chief of Extramural Programs, National Institute of Neurological Diseases and Blindness, National Institutes of Health, Bethesda 14, Md.

Obstetrics and Gynecology Board Gives Part II Examinations

The American Board of Obstetrics and Gynecology will hold part II oral and clinical examinations for all candidates, May 8-19, at the Edgewater Beach Hotel in Chicago.

Formal notice of the exact time of each candidate's examination will be sent him in advance of the examination dates. Candidates who participated in the part I examinations will be notified of their eligibility for the part II examinations as soon as possible. Current bulletins of the board outlining the requirements for application may be obtained by writing to the secretary: Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

Baylor University College of Medicine

The National Foundation has announced two grants to the Baylor University College of Medicine. The first, in the category of after-effects research grants, is $19,637, to continue the study of the use of surgical internal strut spine fixation procedure to prevent progressive sideways curvature of the spine, and to evaluate the effects of this surgery on the lung and heart functions of the paralyzed patient. The second is a rehabilitation center grant of $135,803.

Awards Listed for Obstetrics Gynecology Manuscripts

The Division of Obstetrics and Gynecology of the International College of Surgeons is offering a first award of $500 and a second prize of $300 in its second annual competition for best manuscripts.

The contest is limited to (1) interns, residents, or graduate students in obstetrics and gynecology, or (2) those engaged in the practice or teaching of the specialty. Contestants must hold a degree of medicine from an accredited college, and fellows of the International College of Surgeons are not eligible. Manuscripts of not more than 5,000 words must be submitted on or before June 1 to Dr. Harvey A. Gollin, secretary of the prize committee, 55 East Washington Street, Chicago 2. For further information, interested persons may write Dr. Gollin.

DRUG NOTES

Older Cough Preparations Can Be Fortified with New Agents

Although there are certain areas of new products tied closely with research and development, there are others in which the usual expenses have been amortized to some extent. Patients do not seem to mind the price of the antibiotics, but they do feel that highly priced cough preparations are unjustified. The most recently introduced formulations are priced at almost double many of their postwar counterparts. This is readily understandable because of increased labor, ingredients, packaging, and transportation costs. It appears too that manufacturers would rather put out new formulations at justifiably increased prices than to advance the price of older ones. These older ones then are soon forgotten because of extensive and potent promotion of the newer products.

While this trend exists, advantage may be taken of the fact that a former favorite cough preparation is usually still available and, more than likely, still at postwar prices. It may be wise to try using this old favorite as a vehicle and fortifying it with agents of one's own choice. Physicians can check the individual formulation with their pharmacist for incompatibility. Further explanation follows.

Dihydrocodeinone has become a popular antitussive if the number of formulations in which it appears can be used as an indication of such popularity. Table 1 lists many of these preparations. Note too, that with just a few exceptions, they all contain only 10 mg. of dihydrocodeinone per ounce. This is the maximum amount permitted for "exempt" preparations.

Exempt preparations can be purchased in limited quantities, upon request, by the mere signature of the patient. However, most of the preparations listed in table 1 contain other ingredients: antihistamines, nasal decongestants, amphetamines, barbiturates, and others, causing them to be available on prescription only since they carry the "prescription legend." Such cough formulations are promoted ethically and not generally advertised to the lay public.

Straight dihydrocodeinone is a "class A" narcotic and cannot be prescribed by telephone except as an already formulated mixture which also contains other medicaments of therapeutic value (exempt preparations).

When 1.5 mg. of homatropine methylbromide is combined with each 5 mg. (the therapeutic dose) of dihydro-

codeinone, the mixture (Hycodan—Endo) is "class B" and can be prescribed orally.

Thus, there is a convenient way to fortify the old favorites. A pharmacist should be able to accomplish this for about 50 to 60 cents for each added 60 mg. of Hycodan.

Dilaudid also may be used to fortify a mixture. However, this makes the prescription a "class A" narcotic. Codeine may be added up to 1 grain per dose and still remain "class B."

Antihistamines such as chlorpheniramine and decongestants such as phenylpropanolamine are available and may be added if desired.

TABLE 1.—*A Partial List of Dihydrocodeinone-Containing Cough Preparations.**

	Dihydrocodeinone	Antihistamine	Decongestant	Price†
Amophon-C (McNeil)	x			$1.75
Anacol (Warren-Teed)	x			1.80
Codalex (Mallard)	x			1.55
Codedrate (Central)	x			2.10
Dicosed (Flint Eaton)	x			1.55
Dicotrate (Buffington)	x			1.75
Drodeine (Pitman-Moore)	x			2.10
Hycodan Syrup	30 mg/oz.			2.85
Nullicof (Noyes)	x			1.85
Per-Sed (Columbus)	x			1.45
Codetrate with Parmal (Central)	x	+		——
Codimal (Central)	x	+		2.55
Codistan (Chicago Pharmacal)	x	+		2.65
Coricidin (Schering)	x	+		2.10
Dicoril (Lemmon)	x	+		1.35
Dicotrate with Paraminyl (Buffington)	x	+		1.90
Dycomene (Hance Bros. & White)	x	+		——
Endotussin (Endo)	x	+		2.15
Hycomine (Endo)	30 mg/oz.	+		3.00
Neotuss PT (Lloyd, Dabney & Westerfield) (+ amphetamine)	x	+		2.25
Pyraldine (Vanpelt & Brown)	x	+		2.00
Pyrihist (Evron)	x	+		1.40
Pyrilicod (Raymer)	x	+		1.95
Tussar (Armour)	x	+		2.00
Tussionex (Strasenburgh) (long acting resin)	30 mg/oz.	+		6.25
Bronsyl (McNeil)	x		+	1.95
Calcidrine (Abbott) (+ Nembutal)	x		+	1.65
Hasanone (Haskell)	x		+	1.95
Mercodol (Merrell)	x		+	1.95
Orthoxicol (Upjohn)	x		+	2.25
Citra (Boyle)	x	+	+	2.95
Codigesic (Central) (+ p-acetyl-amino phenol)	x	+	+	2.75
Codimal-PH (Central)	x	+	+	2.65
Dicodrine (Breon)	x	+	+	1.85
Dimetane Expect. HC (Robins)	x	+	+	2.80
Mercodol with Decapryn (Merrell)	x	+	+	2.25
NeoAnacol (Warren-Teed)	x	+	+	2.15
Novahistine DH (Pitman Moore)	x	+	+	2.80
Pyraldine #2 (Vanpelt & Brown)	x	+	+	2.60
Pyrased (Columbus)	x	+	+	1.70
Tussilor (Taylor Labs)	x	+	+	1.95

*Along with varying amounts of antihistamine and decongestant as indicated and other substances such as expectorants, aromatics, and flavoring agents and vehicle.

†Approximate retail price of 4 oz. prescription based on the Central Pharmaceutical Journal pricing schedule. (No admixture.)

x = 10 mg. (1/6 gr.) per ounce maximum "exempt" amount.

TABLE 2.—*A Partial List of "Old Favorite" Cough Preparations.**

Popular about 1946

	Antihistamine	Decongestant	Price† 4 oz. B
Calcidrine (Abbott) (+ Nembutal and dihydrocodeinone)		+	$1.85
Cerose (Ives Cameron) (with codeine)	+		2.50
Cetro Cirose (Ives Cameron) (with codeine)			2.00
Cheracol (Upjohn) (with codeine)			1.90
Cher-Iomine (Pitman-Moore)			1.35
Cidicol (Upjohn) (with ethylmorphine)			1.90
Citro thiocol (Hoffman LaRoche) (with codeine)			2.30
Copavin compound (Lilly) (with codeine)			2.00
Cosadein (Parke-Davis) (with codeine)			1.90
Cosanyl (Parke-Davis) (+ ethylmorphine)			1.30
Emeracol (Upjohn) (with codeine)			1.45
Ephedrol with codeine (Lilly)		+	1.80
Linctus Compound (Merck, Sharp and Dohme) (with codeine)			1.30
Nethacol (Merrell)		+	1.65
Sedatole (Merck, Sharp and Dohme)			1.80
Sedatussin (Lilly)			1.10
Senodin (Squibb) (with codeine)			1.85
Popular about 1951			
Benyline Expectorant (Parke-Davis)	+		1.50
Cobenzil (Abbott)			1.75
Cotussis (National) (with codeine)			1.80
Pyribenzamine Expect. & Ephedrine (Ciba)		+	2.10
Drodeine (Pitman-Moore) (+ dihydrocodeinone)			2.10
Elixoid (Burroughs-Wellcome) (+ ethylmorphine)			1.60
Histadyl EC	+	+	2.00
Mercodol (Merrell)		+	2.65
Proketuss (Merck, Sharp and Dohme)	+	+	1.40

*Along with antihistamines, decongestants as indicated and other substances such as expectorants, aromatics, flavoring agents and vehicle.

†Approximate retail price of 4 oz. prescription (no admixture) based on current prices and pricing schedule.

SALIMEPH FORTE (Kremers-Urban) is a new formulation for massive salicylate therapy. Each tablet contains salicylamide 500 mg., mephenesin 333 mg., along with ascorbic acid 50 mg. The dose is 2 or more tablets four

times a day after meals and at bed time as an antiarthritic, analgesic, anti-inflammatory agent.

Salimeph-C, physicians will recall, was a successful combination that achieved popularity in the early 1950's. Its formula for comparison is salicylamide 250 mg., mephenesin 250 mg., with ascorbic acid 15 mg.

The original product and its ingredients are so well known that nothing more need be said.

TRIBURON (Roche) is a new broad spectrum topical microbiocide to control primary and secondary skin and wound infections. The chemical is a double-barreled quaternary ammonium compound fitting the cationic surface active agent class such as benzalkonium chloride (Zephiran) and cetylpyridinium chloride (Ceepryn). For a more complete discussion on this type of agent see "Bradasol," in the *Journal,* December 1958, p. 869.

Triburon is available in a 0.1 per cent ointment, plain and with 0.5 per cent hydrocortisone. The new drug is said to be highly active against both Staphylococci and Streptococci and also active against other gram positive and gram negative pathogens.

Triburon is suggested for use in pyodermas, impetigo, furunculosis, hydradenitis, ecthyma, pustular folliculitis, infected eczematoid dermatitis, burns, and infected stasis ulcers.

The plain ointment is available in 1 ounce tubes and retails about $2.50 to $2.75. The ointment with hydrocortisone is available in 5 Gm. tubes at about the same price.

NEPTAZONE (Lederle) methazolamide is a sulfonamide having no bactereostatic activity. Neptazone is closely related to Diamox (Lederle), acetazolamide. Neptazone can be thought of as methylacetazolamide. Both drugs are carbonic anhydrase inhibitors and useful in the treatment of glaucoma. Other applications for Neptazone may appear later.

Neptazone is slow starting, but is longer acting than Diamox and has about one-fourth the dosage of the latter. It is postulated that urinary calculi formation might not be a problem with prolonged therapy using the newer drug.

Neptazone has been shown to be therapeutically effective in 50 per cent of the patients not responding to Diamox. Also 50 per cent of the patients not able to tolerate Diamox were controlled with Neptazone.

The dose of Neptazone is 50 to 100 mg. two or three times a day. Miotics may also be needed in certain cases.

Diamox is the drug of choice because it is effective in 83 per cent of the cases, whereas Neptazone is effective in about 68 per cent of the cases. It is suggested that Neptazone be considered for patients not responding to or not tolerating Diamox.

—HERBERT SCHWARTZ, M.S., Austin.

OF GENERAL INTEREST

Personals

Dr. Denton A. Cooley, Houston, spoke on cardiovascular surgery when he appeared as one of 14 speakers at the 1959 Atlanta Graduate Medical Assembly February 16-18 in Atlanta, Ga.

The Rev. G. Z. Sadler of Brookshire, retired Methodist minister and father of *Dr. Charles B. Sadler,* Amarillo, died in a Houston hospital February 1, 1959.

Newly elected treasurer of the Littlefield Chamber of Commerce is *Dr. D. J. Stafford* of that city.

Two San Antonio physicians elected to the board of trustees of the San Antonio Medical Foundation recently are *Dr. Walter Walthall* and *Dr. Harold Vagtborg.*

Dr. John B. Thomas, long-time trustee or governor of the Midland Memorial Foundation, which operates Midland Memorial Hospital, was honoree at a surprise February ceremony during which it was announced that the hospital's new east wing will be dedicated to him. A large bronze plaque bearing a likeness of the doctor was unveiled at this time and is being placed in the hospital wing.

Dr. Homer E. Prince of Crockett has been elected vice-president of the American Academy of Allergy, which will have its next annual meeting January 11-13, 1960, at Hollywood-by-the-Sea, Fla.

Dr. Merton M. Minter, San Antonio physician, has been elected chairman of the University of Texas Board of Regents for a 2 year term.

Dr. Milford O. Rouse of Dallas, current president of the Southern Medical Association, is the subject of a biographical sketch in *Scope Weekly* for March 11.

The *AMA News,* published by the American Medical Association, used in its December 29 issue an article on *Dr. Oscar Morphis* of Fort Worth. It described the metal and wood workshops in which he spends his leisure time.

Dr. John W. Fisher, Dallas, teamed with Mrs. David B. Hawes, Fort Worth, to win the 1958 open pair championship at the recent National Bridge Tournament in Detroit.

Dr. John M. Taylor of Quanah has taken a leave of absence from the Quanah Clinic to accept a fellowship in obstetrics and gynecology at Ochsner Foundation. His address is 3005 Ridgeway Drive, Whitney Heights, Metairie, La.

Dr. Stuart A. Wallace, chairman, Department of Pathology, was presented with the George T. Caldwell Award, naming him "Pathologist of the Year for the State of Texas" at a meeting of the State Clinical Pathologists in Houston.

Dr. Marjorie J. Williams of Temple displayed a scientific exhibit at the California Medical Association annual session in San Francisco, February 22-25. She was accompanied to California by her husband, *Dr. B. H. Williams.*

Dr. Robert E. Leslie, El Campo, attended the third World Congress of Cardiology in Brussels, Belgium as the official delegate of the Texas Heart Association, of which he is president-elect.

Recent additions to the Texas medical family have been a daughter adopted by *Dr. and Mrs. Galen Steeg* of Groveton; a daughter born to *Dr. and Mrs. Earle Griffey* of Brownsville; and a daughter born to *Dr. and Mrs. Raymond Thomas* of Eagle Lake.

Space Medicine, A New Science, Bridges Miles Between Texas and Moon

Just as every flyer in the United States Air Force today owes his life, in part, to the research and instruction carried on continuously for almost 40 years by the School of Aviation Medicine at Randolph Air Force Base, so the astronaut of tomorrow will be equally indebted to the school's Division of Space Medicine, which celebrated its tenth anniversary February 9, 1959.

On that February day, a contingent of civilian and military scientists and leaders gathered in San Antonio to honor the handful of men whose vision made the Division of Space Medicine possible—and to chart plans for future research whose goals include sending men into the farthest reaches of space.

In July, 1959, the School of Aviation Medicine will be

moved from Randolph back to an earlier home, Brooks Air Force Base, where it will have, for the first time, first class accommodations, including classrooms for 735 students, a four floor Research Institute, a Flight Medicine Laboratory, a heating-cooling plant, and the most modern equipment available for aeromedical research. Eventually, a $12,000,000 appropriation from Congress will provide a two-story structure for nuclear, biological, and toxicological laboratories, an acceleration laboratory containing a large centrifuge, and a combined library-professional building.

It was not always thus.

The School of Aviation Medicine began small—and as the direct result of an astounding discovery made by the British early in World War I. It was discovered that of every 100 pilot fatalities in that conflict, only 2 were due to enemy action and 8 to airplane failure. Of the 90 who remained, 30 died through their own carelessness or recklessness. The remaining 60 flyers were killed by their physical unfitness.

By the time the United States entered the war, the need for some kind of specialized medical care was clear, and in 1917 Lt. Col. Theodore C. Lyster was appointed the first chief surgeon of the Army's Aviation Section. The first medical research laboratory was established on Long Island in 1918, and it graduated three flight surgeons 6 months later.

During the war, the flight surgeon program quickly showed dramatic results, but at its end, interest in the aeromedical research field almost died.

In 1919, the laboratory was revived under direction of Major Louis H. Bauer, later to become President of the American Medical Association, and the institution's name was officially changed to "School of Aviation Medicine." In 1926, the school moved to Brooks Air Force Base, and, in 1931, to Randolph.

During World War II, the school expanded until temporary branches had been set up elsewhere around the country, and by war's end the school had graduated more than 4,200 medical officers and several thousand nurses and aeromedical technicians. (In the entire four decades of its existence, the School of Aviation Medicine has graduated nearly 9,000 doctors, plus the thousands of nurses and technicians.)

Development of jet aircraft and the advent of rocket missiles and planes posed new medical problems for the flyer after World War II, creating a need for growing research efforts.

A new, controversial area was opened in 1948 when Major General Harry G. Armstrong, then commandant of the School of Aviation Medicine, called a meeting of prominent scientists to discuss the aeromedical problems of space flight.

The following year, a Department of Space Medicine was founded, with Dr. Hubertus Strughold as its head. Often called "the father of space medicine," Dr. Strughold is an American citizen who was, before World War II, director of the Aeromedical Research Institute in Berlin. He is now serving as adviser for research and professor of space medicine at the school.

Another German specialist whom General Armstrong recruited was Dr. Heinz Haber, an astrophysicist, who, together with physiologist Strughold, bioclimatologist Dr. Konrad J. K. Buettner, and Dr. Fritz Haber, an aerodynamic engineer—brother of Heinz Haber, formed the first space medicine department staff.

"Our work was not always taken seriously by outsiders," Dr. Strughold remembers with a wry smile. "People heard of us, smiled, and shook their heads. To them we were crackpots or wild men. It is perhaps fortunate that our beginning was small, and very very inexpensive . . ."

Establishment of the department, grown into the Division of Space Medicine now, constituted the official founding of the new science of space medicine in America, and the institution has been credited with many headline-making firsts during the 10 years of its existence.

The division created the world's first "space cabin" or sealed cabin simulator to study man's tolerance to isolation, confinement, artificial day-night cycles, and atmospheric change. First intensive work was begun here on a closed ecological system using algae to absorb carbon dioxide and produce oxygen in an endless photosynthetic cycle and thus keep man alive indefinitely in a sealed cabin in outer space.

The first serious American studies of the effects on man of zero-gravity, or "weightlessness," are going on in the division and are producing data which indicate that man can adapt fairly readily to short periods of weightlessness.

Long before science knew of the dense radiation belts surrounding earth, Division of Space Medicine scientists were studying the extent and nature of hazards which might be posed by radiation, meteors, and cosmic rays in outer space. In 1956, another significant "first" was the start of a research project aimed at determining what sort of life might survive the hostile atmosphere of Mars.

Scientists, military men, physicians, the press, and other guests attending the February 9 anniversary celebration heard Col. Paul A. Campbell, current chief of the Division of Space Medicine and former director of medical research, describe the present work of the school. Dr. Strughold, who recently received the Dr. John J. Jeffries Award for 1958, discussed "Space Medicine of the Next Decade as Viewed by a Physician and Physiologist."

Dr. Heinz Haber, now scientific consultant to the Columbia Broadcasting Company and author of such books as "Man in Space" and "Our Friend the Atom," spoke on the astrophysical aspects in the coming decade of space medicine, while Dr. Buettner, now a professor with the University of Washington Department of Meteorology and Climatology, gave a forecast on the upcoming space decade from the standpoint of an environmental physicist. Dr. Fritz Haber, who is now with AVCO in Stratford, Conn., presented his views on engineering developments ahead, and Lt. Gen. Roscoe C. Wilson, USAF deputy chief of staff for development, pointed up the "Future of the Space Sciences." Maj. Gen. Otis O. Benson, Jr., commandant of the School of Aviation Medicine, was also an anniversary speaker.

What do these men see ahead?

"An American ship could land on the moon in 5 years if we hurry," says Dr. Strughold. From the medical standpoint, the first man in space should be an experienced jet pilot, he believes, and not a woman, a hermit, a monk, nor a schizophrenic. He should be strongly motivated and be familiar with the medical problems in flight. Only those men should be chosen for space-crew training whose hearts and circulatory reflex mechanisms will enable them to stay alive during the post-acceleration recovery phase.

So, the studies continue in the School of Aviation Medicine's Division of Space Medicine: studies which will make man's flight to the moon and beyond a reality.

State Health Commissioner Resigns

Dr. Henry A. Holle, commissioner of health for Texas since 1954, resigned this position effective April 8. Dr. J. E. Peavy, director of communicable disease control for the State Department of Health, has been named acting commissioner.

Mental Health Campaign To Be Held April 26-May 2

Just ahead is the annual campaign of the National Association for Mental Health to raise funds and focus attention on the nation's number one health problem—mental illness. Beginning with Mental Health Week, April 26-May 2, the campaign will continue throughout the month of May.

Money received during the campaign goes in five directions: research, adequate treatment, early detection, rehabilitation, and public education.

The National Association for Mental Health is made up of more than 750 local and state mental health associations and is the only national voluntary citizen's group dedicated to the total fight against mental illness.

There are an estimated 17,000,000 people in the United States suffering from mental illness, according to the organization. One out of every 10 children born in America each year will sometime during his life suffer a mental illness severe enough to require hospitalization; the number who will develop less severe mental illness is much greater.

Although for the third year the mental hosiptal population has decreased and 7 out of 10 mental patients leave the hospital improved or recovered, patients in mental hospitals make up on any day almost half of all the patients in the hospitals in the United States. In addition to persons in mental hospitals, at clinics, or consulting private psychiatrists for treatment of mental illness, approximately 50 per cent of all the patients who go to general practitioners are suffering from mental illness and other personality disturbances or physical illnesses associated with mental illness.

Emphasizing the fact that mental illness is becoming a major problem of our time, World Health Day, which marked the eleventh anniversary of the World Health Organization on April 7, had as its theme, "Mental Illness and Mental Health in the World of Today."

New Houston Rehabilitation Center To Be Dedicated in May

The Cora and Webb Mading Memorial Building of the Texas Institute for Rehabilitation and Research, Houston, will hold its formal dedication ceremonies during the last week of May.

Located on a 4½ acre tract immediately behind the Baylor University College of Medicine in Houston, the institute was made possible by philanthropic donations. It is chartered and incorporated as a special hospital for disabled persons and is operated under a board of trustees as a nonprofit institution.

All comprehensive services previously provided by the

Formal dedication ceremonies will be held for the Cora and Webb Mading Memorial Building of the Texas Institute of Rehabilitation and Research in Houston in May.

Southwestern Poliomyelitis Respiratory and Rehabilitation Center at Jefferson Davis Hospital and the Wolff Home Polio-Rehabilitation Unit have been transferred to this facility, the first patients having been moved in during February.

Application for admission to the institute should be made by the patient's own physician. The organization will work closely with the National Foundation, and, as the incidence of poliomyelitis decreases, other patients will be accepted. Eventually, some 100 persons will be handled daily on an out-patient basis.

Now a 55 bed chronic illness and research hospital, the Institute also includes an orthetic department for the development and manufacture of assistive devices. Production and use of special self-help and self-care devices is aimed at increasing the independence of severely paralyzed persons.

Charges for services rendered will be on an actual cost basis and will be all inclusive.

Poison Control Association Formed

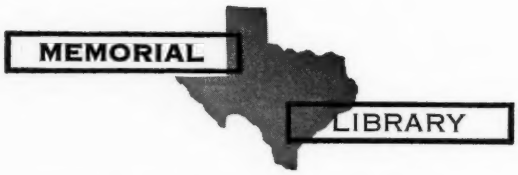
The American Association of Poison Control Centers was formed in Chicago, October 21, 1958, with membership open to both individuals and organizations. The new association hopes to stimulate educational programs and scientific research on toxic substances; assist state and local officials and voluntary agencies in the field of poison control; set up standards for operation of poison control centers; provide information to the public and develop information services; and help develop insurance liability programs.

Dr. Robert Grayson, Miami, was elected president.

Hospital District Approved by Amarillo

The city election held in Amarillo on January 17 for the purpose of accepting the hospital district as provided in a Texas constitutional amendment passed on November 4, carried by a vote of more than 5 to 1. As of yet, no effective date of transfer of Northwest Texas Hospital to the hospital district has been set.

The number of cases of paralytic polio in the United States was 24 per cent higher for 1958 than 1957—apparently because apathy is keeping many people from getting Salk injections. Only 45 per cent of the preschool children and 30 per cent of adults 20-39 years old have been fully vaccinated, according to Health Information Foundation.



Stewart Books Given to Library

Eight books, some medical and some historical, which once belonged to Dr. Charles Bellinger Stewart, early Texas physician and signer of the Texas Declaration of Independence, have been presented to the Memorial Library of the Texas Medical Association.

They are the gift of Dr. Charles M. Covington, Austin State Hospital staff member who was a 1913 graduate of the Baylor University College of Medicine and 1951 president of the Orange County Medical Society. Dr. Covington received the volumes from the late Mrs. Dora Griffin of Houston, granddaughter of Dr. Stewart.

Dr. Stewart was born in Charleston, S. C., in 1806, owned an interest in a drugstore in Columbus, Ga., for some time, and was a businessman in New Orleans and Cuba before coming to Texas in 1830. Settling in Brazoria, he joined the command of Francis W. Johnson raised to attack the Mexican fort at Anahuac and held a number of appointive offices following the Convention of 1832.

When Dr. Stewart became secretary to Governor Henry Smith in the winter of 1835, there was no seal of office, so he used a "private seal" which has been credited with supplying the Texas star as the seal of the state. The private seal was a Stewart family heirloom, a button from England, which bore a deeply-cut star on mother-of-pearl.

After the Texas revolution, Dr. Stewart practiced medicine in Montgomery. He represented Montgomery County at the Convention of 1845 and in the first, fourth, and fourteenth Legislatures. He died in 1885.

The books formerly belonging to him are the following:

Chapman, N., M.D., *Elements of Therapeutics and Materia Medica, to which are Prefixed Two Discourses on the History and Improvement of the Materia Medica, Originally Delivered as Introductory Lectures,* Vols. I and II, 1821-1822.

Gibson, William, M. D., *The Institutes and Practice of Surgery: Being the Outlines of a Course of Lectures,* Vols. I and II, 1827.

Massie, J. Cam., M.D., *A Treatise on the Eclectic Southern Practice of Medicine,* 1854.

Annual Report of the Board of Regents of the Smithsonian Institute, Showing the Operations, Expenditures, and Condition of the Institution for the Years 1863, 1864.

Laws and Decrees of the State of Coahuila and Texas in Spanish and English, to which is added The Constitution of Said State, also The Colonization Law of the State of Tamaulipas and Naturalization Law of the General Congress, by order of the Secretary of State, translated by J. P. Kimball, M.D., Houston, Telegraph Power Press, 1839.

Vestiges of the Natural History of Creation with a Sequel, 1846.

References

Nixon, P. I.: *The Medical History of Early Texas,* Lancaster, Pa., Lancaster Press, 1946.

Webb, W. P. (Ed.): *The Handbook of Texas,* Austin, Texas State Historical Association, 1952.

Gifts to the Library

Dr. H. J. Kaplan, Bay City, 14 books.
Dr. Heinrick Lamm, La Feria, 125 journals.
Dr. Allan H. Neighbors, Austin, 10 journals.
Dr. Joe C. Rude, Austin, 30 journals.
Dr. Troy A. Shafer, Harlingen, 57 journals.
Dr. C. M. Covington, Austin, 7 books.
Dr. Carey Legget and Dr. Georgia Legget, Austin, 74 journals, 2 reprints.
Dr. Fred L. Adair, Maitland, Fla., 13 reprints.

★ Motion Pictures

Films Newly Acquired

Motion picture films recently acquired by the Memorial Library of the Texas Medical Association include the following:

Back into the Sun
Bedside Management of Fluid Balance Problems
Biography of the Unborn
Borderline
For the Love of Life
Helping Hands for Julie
Home Again
New Family in Town
Principles of Artificial Respiration
The H-Bomb
The Man Who Didn't Walk
Bedside Management of Fluid Balance Problems
Respiratory Acidosis
Vaginal Hysterectomy

★ Books

Books Newly Acquired

Arrington, George E., Jr.: *History of Ophthalmology,* New York, MD Publications, 1959.

Bailey, Hamilton,: *Emergency Surgery,* Baltimore, Williams and Wilkins, 1959.

Bleyer, Adrien: *Childbearing Before and After Thirty-Five,* New York, Vantage, 1958.

Byrne, John J.: *The Hand,* Springfield, Ill., Charles C Thomas, 1959.

Ciba Foundation Symposium: *Amino Acids and Peptides with Antimetabolic Activity,* Boston, Little, Brown and Company, 1958.

Conn, Howard F.: *Current Therapy—1959,* Philadelphia, W. B. Saunders, 1959.

Eckardt, R. E.: *Industrial Carcinogens,* New York, Grune and Stratton, 1959.

Freeman, Lucy: *So You Want to be Psychoanalyzed,* New York, Henry Holt, 1958.

Goodrich, Frederick W.: *Maternity,* New York, Prentice-Hall, 1959.

Jaffee, Henry L.: *Tumors and Tumorous Conditions of the Bones and Joints,* Philadelphia, Lea and Febiger, 1958.

May, Jacques M.: *The Ecology of Human Disease,* New York, MD Publications, 1958.

Moseley, H. Fred: *Textbook of Surgery,* ed. 3, St. Louis, C. V. Mosby, 1959.

Mullane, Mary Kelly: Education for Nursing Service Administration, Battle Creek, Mich., W. K. Kellogg Foundation, 1959.

New and Nonofficial Drugs, 1959, Evaluated by the American Medical Association's Council on Drugs, Philadelphia, J. B. Lippincott, 1959.

Ranson, Stephen Walter, and Clark, Sam L.: Anatomy of the Nervous System, ed. 10, Philadelphia, W. B. Saunders, 1959.

Riese, Walther: *History of Neurology,* New York, MD Publications, 1959.

Ross, Sir James Paterson: *Surgery of the Sympathetic Nervous System,* ed. 3, London, Bailliere, Tindall and Cox, 1958.

Schifferes, Justus J.: *Family Medical Encyclopedia,* Boston, Little, Brown and Company, 1959.

Turell, Robert: *Diseases of the Colon and Anorectum,* Vol. 1 and 2, Philadelphia, W. B. Saunders, 1959.

Weil, Paul G.: *The Plasma Proteins,* Philadelphia, J. B. Lippincott, 1959.

Year Book of Ear, Nose and Throat, Lindsay, John R. (Ed.): Chicago, Year Book Publishers, 1958.

Book Notes

Cardiovascular Rehabilitation

PAUL DUDLEY WHITE, M.D., Physician, Massachusetts General Hospital, Boston; HOWARD A. RUSK, M.D., Director, Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, New York; BRYAN WILLIAMS, M.D., Clinical Instructor in Medicine, University of Texas Southwestern Medical School, Dallas; and PHILLIP R. LEE, M.D., Department of Internal Medicine, Palo Alto Clinic, Palo Alto, Calif. 155 pages. $6.50. New York, Blakiston Division, McGraw-Hill Book Company, Inc., 1957.

This book presents the views of several authorities on the subject of cardiovascular rehabilitation as set forth at an informal conference. It is extremely readable and condenses the current thinking on rehabilitation of the ever increasing number of people with cardiovascular disorders and their complications.

Very properly the emotions of the patient, the physician, and the patient's family are discussed. Truth about a particular disease should be made known to the patient and his family. Psychiatric disorders should be dealt with, and iatrogenic heart disease is to be guarded against.

The trend in American industry is to employ and place the cardiac in a position he can perform. Peak load work ranges from 20 to 40 per cent of actual working hours. Good industrial physician-employee relationship is stressed.

The majority of patients with coronary heart disease can and should return to their former occupations. Hemiplegics and paraplegics can be placed frequently in positions to earn an income. Several federal and state agencies and civic organizations are available to aid the physician. Conscientious recommendations of the attending physician will rehabilitate the majority of cases.

There is being added to some medical school curriculums actual experience in advising the chronically ill. Students "learn by doing." Postgraduate education in rehabilitation is being and should be carried out. The American Heart Association provides literature and audiovisual devices that teach cardiovascular rehabilitation.

The conference recommended that considerable research is needed so that statistically accurate advice can be given a cardiac or hemiplegic patient. Research in the performance of children on whom cardiac surgery had been done is needed greatly. The psychological and psychiatric aspects of rehabilitation are important phases in need of further study.

—Pierre P. Poole, M.D., Brownsville.

Rehabilitation Medicine

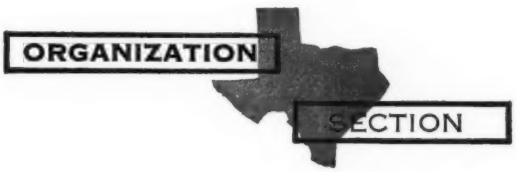
HOWARD A. RUSK, M.D., Professor and Chairman of the Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, New York. 572 pages. $12. ed. 1. St. Louis, C. V. Mosby Company, 1958.

Rehabilitation is the business of every physician, be he a general practitioner or a specialist. This book is one that focuses attention on the problem of the rehabilitation of severely involved individuals with neuromuscular dysfunction or musculoskeletal disorders. There are 27 chapters contributed by 36 collaborators. The authors emphasize that physical medicine and rehabilitation is an indispensable adjunctive treatment method in many medical and surgical conditions in the different fields of medicine. There are chapters which outline the basic principles of treatment by various phases of physical medicine and the application of orthotic devices to help the patient regain the maximal functional activity possible.

The basic philosophy throughout the book is that it is necessary to treat the whole individual who is suffering from handicaps imposed by some disease or injury, and not only the physical or bodily segment that is involved. The patient has to be advised not only on medical matters, but also in his emotional problems, social readjustment, and vocational pursuits until his greatest capacity is regained. This book is one which emphasizes that a physician is not only a scientist treating a certain disease, but is also an adviser and counselor to the patient, which role was so well portrayed by the vanishing group of the family physician.

This is an excellent textbook for providing basic information on rehabilitation medicine and should be invaluable to every physician, especially the general practitioner.

—Odon F. von Werssowetz, M.D., Gonzales.



★ County Societies

County Societies Elect Officers

Newly elected officers of county medical societies in Texas, not previously announced, include the following:

Gray-Hansford-Hemphill-Lipscomb-Roberts-Ochiltree-Hutchinson-Carson.—President, Dr. Dan E. Hampton, Borger; vice-president, Dr. R. D. Falkenstein, Pampa; secretary-treasurer, Dr. Joe H. Knowles, Borger; delegate, Dr. Raymond M. Hampton, Pampa; alternate, Dr. W. G. Stephens, Borger.

Hardeman-Cottle-Foard-Motley.—Secretary-treasurer, Dr. J. F. Hughes, Spur, replacing Dr. John M. Taylor, Quanah, who has left the state to accept a medical fellowship.

Johnson.—President, Dr. C. D. Hamilton, Jr., Cleburne; secretary and delegate, Dr. Tolbert F. Yater, Cleburne.

Karnes-Wilson.—President, Dr. John V. Blake, Jr., Floresville; vice-president, Dr. T. P. Edwards, Karnes City; secretary-treasurer, Dr. Fred Day, Jr., Runge; delegate, Dr. J. W. Oxford, Floresville; alternate, Dr. C. C. Quillian, Kenedy; board of censors, Dr. Quillian and Dr. S. E. Shannon, Karnes City.

Kimble-Mason-Menard-McCulloch.—President, Dr. B. A. Hallum, Jr.; vice-president, Dr. James P. Anderson; secretary-treasurer, Dr. Robert D. Hays; delegate, Dr. Albert M. McCulloch; alternate, Dr. Robert D. Hays; board of censors, Drs. G. H. Ricks, James G. Bodenhamer, and D. W. Jordan, all of Brady.

Lavaca.—President, Dr. Robert W. Williams, Shiner; vice-president, Dr. E. H. Marek, Yoakum; secretary-treasurer, Dr. Robert J. Wagner, Shiner; delegate, Dr. Harvey Renger, Hallettsville; alternate, Dr. William H. Yates, Hallettsville; board of censors, Drs. Renger, Yates, and Williams.

Shelby-San Augustine-Sabine.—President, Dr. Thomas L. Hurst; president-elect, Dr. L. S. Oates; vice-president, Dr. W. H. Warren; secretary-treasurer, Dr. W. C. Windham; delegate, Dr. W. S. Warren; alternate, Dr. L. S. Oates; board of censors, Drs. W. H. Warren and Oates, all of Center.

Victoria-Calhoun-Goliad.—President, Dr. C. J. McCollum, Victoria; vice-president, Dr. York Lancaster, Port Lavaca; secretary, Dr. Calon U. Bickford, Victoria; delegate, Dr. Joseph V. Hopkins, Victoria; alternate, Dr. Ern C. Mooney, Victoria; board of censors, Drs. T. L. Sterne, R. S. Lander, and Craig P. Bade, all of Victoria.

County Society News Briefs

"Clinical Problems in the Management of Cancer" was the topic of Dr. George Crile, Jr., when he addressed the *Harris County Medical Society* during its scientific meeting in Houston March 23. Proposed amendments to the by-laws were read during the business session.

Dr. John M. Whitney of Dallas, guest speaker, discussed the "Medical Aspects of Civil Defense" when he addressed the *Cameron-Willacy Counties Medical Society* in Brownsville recently. The society voted to oppose a bill recently introduced in the Texas Legislature relating to vaccination of school children, and voted to present $10 prizes to best exhibits at science fairs of each area high school. The society president was instructed to appoint a committee to study the fees charged on workmen's compensation and bracero insurance cases.

Physicians attending a January meeting of the *Lamar-Delta Counties Medical Society* voted unanimously to begin an intensive program to encourage all persons under 40 years of age in their area to secure Salk vaccine inoculations immediately, regardless of ability to pay. Dr. M. A. Walker, Jr., president, indicated that the group would welcome cooperation of the National Foundation, school principals and health nurses, as well as other community groups in making arrangements for those unable to pay.

The *Pecos-Jeff Davis-Presidio-Brewster Counties Medical Society* heard Dr. Lewis Zang, Odessa, discuss "Allergic Disease in Children," when it held its March dinner meeting in Fort Stockton.

The *Tarrant County Medical Society* adopted a resolution endorsing and supporting a hospital district bill when it held its February meeting attended by 128 members and 16 guests. The group voted to nominate Dr. A. F. Jackson for honorary membership in the Texas Medical Association. During the scientific program, Dr. Milton V. Davis, Dallas, spoke on "Chest Emergencies."

When the *Lamb-Bailey-Hockley-Cochran Counties Medical Society* held a recent meeting in Levelland, Dr. F. B. Faust, president, presented a paper on "Alternatives of Health Economics." Dr. Robert A. Neblett, Canyon, was guest speaker for the February meeting of the society, which was held in Littlefield.

★ District Societies

District 1 Elects Officers

Dr. W. E. Lockhart of Alpine was elected president of District 1 of the Texas Medical Association at the annual business meeting of the district in Fort Stockton February 12. Other officers are Dr. W. H. McClure of Kermit, vice-president, and Dr. Gordon L. Black of El Paso, secretary.

The meeting was held in conjunction with a one-day seminar presented by the El Paso division of the University of Texas Postgraduate School of Medicine. Speakers included Dr. Maynard Hart and Dr. Harry W. Demarest, both of El Paso; Dr. C. E. Oswalt of Fort Stockton; Drs. Leight Avner, James Morgan, Gray Morgan, and Gilbert Landis, all of El Paso; and Mrs. Haskell D. Hatfield of El Paso, president-elect of the Woman's Auxiliary to the Texas Medical Association.

McKay Becomes President Of Ninth District Society

Dr. Haden E. McKay of Humble became president of the Ninth District Medical Society at its meeting March 19 in Huntsville. Dr. F. W. Yeager, Corpus Christi, President of the Texas Medical Association, addressed the society at the Huntsville Prison.

Other officers include Dr. Irving M. Watson, Jr., Conroe, president-elect; Dr. George V. Pazdral, Somerville, vice-president; and Dr. Lyman C. Blair, secretary-treasurer. At the meeting, two amendments were voted to the by-laws.

★ American Medical Association

AMA Makes More Appointments

Dr. Edward L. Turner, secretary of the American Medical Education Foundation, has been named director of the new American Medical Association Division of Scientific Activities, and Dr. Walter S. Wiggins was appointed to succeed Dr. Turner as secretary of the Council on Medical Education and Hospitals.

In announcing the staff changes, Dr. F. J. L. Blasingame, executive vice-president, noted that the new division includes the Councils on Mental Health, Scientific Assembly, and Medical Education and Hospitals; the American Medical Education Foundation; and the Department of Therapy and Research.

Dr. Wiggins joined the Council on Medical Education and Hospitals as associate secretary in 1954.

AMA Council to Hold Nutrition Meeting

Heart disease and disorders of nutrient absorption will be discussed at a Symposium on Nutritional Problems in Medicine May 8 in Nashville, Tenn., under the sponsorship of the American Medical Association's Council on Foods and Nutrition and the Vanderbilt University Medical School.

The meeting is opened to physicians, nurses, dietitians, and medical students and other interested persons. Further information may be obtained by writing the American Medical Association, 535 North Dearborn Street, Chicago 10.

Medical Congress Studies Specialism, Research

Specialism in medicine and the role of research in medical education were main discussion topics during the fifty-fifth annual Congress on Medical Education and Licensure February 7-10 in Chicago. The congress was sponsored by the American Medical Association's Council on Medical Education and Hospitals, the Advisory Board for Medical Specialties, and the Federation of State Medical Boards of the United States.

Motion Picture Review Booklet Released

The tenth annual publication of "Reviews of Medical Motion Pictures" is now available from the film library of the American Medical Association. This publication is prepared by the Division of Communications, Department of Medical Motion Pictures and Television, and contains reprints of all reviews published in the *Journal of the AMA* during 1958.

★ Woman's Auxiliary

Films Available to Highlight Woman's Auxiliary Programs

Motion picture films from the Memorial Library of the Texas Medical Association have been found by members of the Woman's Auxiliary to be suitable for many purposes. Some are appropriate for almost all types of audiences.

Almost 100 nontechnical films are available to Texas medical societies and auxiliaries for use in their programs. Many of the films would serve for program material for civic and school organizations to further the cause of medicine in Texas communities. Approved films catalogued for ready use cover a wide range of topics with considerable choice in each category. Among the subjects are the following: cancer, heart disease, rabies, poliomyelitis, tuberculosis, alcoholism, first aid, old age, safety, medical careers (including nurse recruitment), mental health, hospitals, and the doctor. If another subject, other than those mentioned, is desired, those interested may write the Memorial Library for information as new films are constantly being added to the collection.

Films, whether black and white or color, are 16 mm. and nearly all equipped with sound. Some have been released for television showing on local stations.

Requests should be made 2 or 3 months in advance to assure receipt of the desired films. The prompt return of the films by insured mail after each showing is urged by the librarian, as there usually are many bookings for each film. If films are not returned after each showing, another group may be inconvenienced. A return label is placed in the film container for use in returning the film. This provides the post office with necessary information about the contents of the box.

—Mrs. James M. Coleman, Austin.

RECENT DEATHS

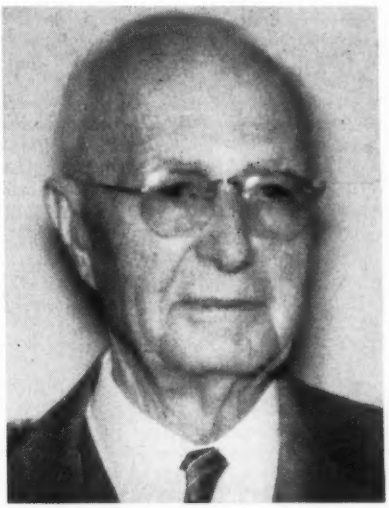
DR. WILLIAM EDGAR TATUM

Dr. William Edgar Tatum, a past president of the Jefferson County Medical Society, died in Gatesville February 3, 1959, of a ruptured aortic aneurysm.

Dr. Tatum was born at Farmersville, La., on October 16, 1873, the son of James A. and Virginia Tatum. He was graduated in medicine at Memphis Hospital Medical College in 1899 and finished his training in special courses at the then Medical Department of Tulane University of Louisiana in 1910. After practicing at Converse, La., for 10 years, he moved to Beaumont in 1911. In that city, he did general practice and surgery until his retirement in 1955 because of ill health. After retirement, he lived in Gatesville.

The physician was elected an honorary member of the Texas Medical Association in 1950 and was a member of the American Medical Association. He was a member of the First Baptist Church of Gatesville, a Mason, and a member of the Lions Club.

Dr. Tatum is survived by his wife, the former Miss Fannie Curtis, whom he married in 1900 in Burkeville, two sons, R. C. Tatum, Gatesville, and B. E. Tatum, Houston; two daughters, Mrs. J. W. Garth, Houston, and Mrs. L. M. Green, Dallas; eight grandchildren; and seven great-grandchildren.

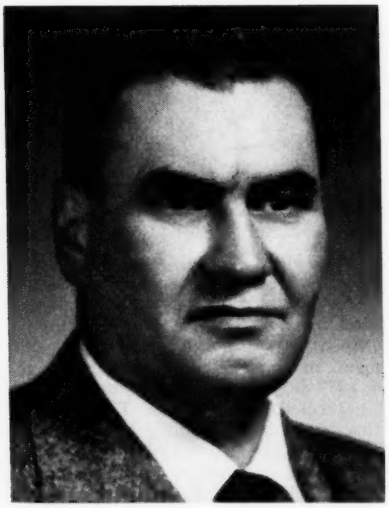


DR. WILLIAM EDGAR TATUM

DR. V. WESLEY WALLACE

Dr. Virgle Wesley Wallace, 49, died in Odessa on January 7, 1959, after a several months' illness.

Dr. Wallace was born in Appleby on July 31, 1909. He was a Phi Beta Kappa graduate of the University of Texas and received his medical degree from the University of



DR. V. WESLEY WALLACE

Oklahoma School of Medicine in 1943. He interned and did his residency at the Oklahoma University Hospitals in Oklahoma City and was resident in surgery at St. Anthony's Hospital there until moving to Gainesville in 1946. He also practiced in Lawton, Okla., at St. Luke's Hospital in Kansas City, and in Waco before moving to Odessa in 1957.

Dr. Wallace was a member of the American Medical Association, Texas Medical Association, and Southwestern Medical Association, and a fellow of the American College of Surgeons, a diplomate of the American Board of Obstetrics and Gynecology, and was at one time secretary of the Cooke County Medical Society. He was a Mason and member of the Methodist Church.

Survivors are his wife, Estelle; two sons, Wendell and Wesley Wallace of Odessa; four sisters, Miss Meritt Wallace and Mrs. Russell Bates of Tipton, Okla.; Mrs. Howard Buckner of Frederick, Okla.; and Mrs. Ward Ulmer of Tulsa, Okla.; three brothers, T/Sgt. Kendall Wallace of Webb Air Force Base in Big Spring, Ormer Wallace of Gilchrist, Ore., and Ottis Wallace of Frederick, Okla.; and his parents, Mr. and Mrs. E. M. Wallace of Tipton, Okla.

Burial was in Tipton, Okla.

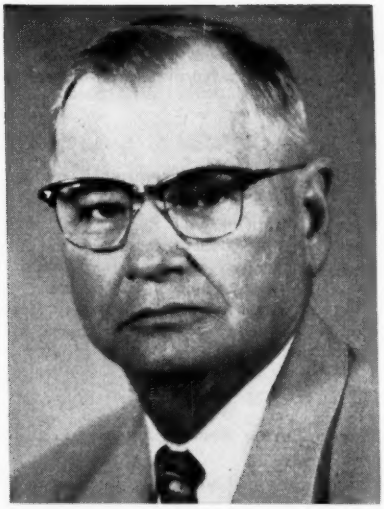
DR. H. D. PRICHARD

Dr. Horace Dewitt Prichard of Wichita Falls died in a hospital in that city January 9, 1959.

He was born in Boonesville, Miss., on October 21, 1889, and was the son of J. O. and Lydia (Bell) Prichard. After attending high school and Trinity University in Waxahachie, he received his medical degree from the University of Texas Medical Branch in 1917. His internship was served at Charity Hospital in Cleveland, Ohio. Dr. Prichard practiced in Burkburnett for 2½ years, and during World War I was a first lieutenant in the Army Medical Corps.

The physician was a 1937 president of the Wichita County Medical Society. He belonged to the Texas Medical Association and the American Medical Association, and was a fellow of the American College of Surgeons.

Dr. Prichard was a Mason, belonging to the Scottish Rite. He was a deacon in the First Baptist Church of



DR. H. D. PRICHARD

Wichita Falls, and belonged to the Wichita Falls Chamber of Commerce. He was a past president of Wichita General Hospital and was voted a life honorary member of the Wichita General Hospital staff.

He is survived by his wife, the former Miss Gretchen Wilke, whom he married in Galveston in 1919; and by three brothers, Dr. F. C. Prichard, Anson; Dr. C. L. Prichard, Abilene; and G. R. Prichard, Haskell.

DR. HARRY PAUL HARBER

Dr. Harry Paul Harber died suddenly of a cerebral hemorrhage in his Dallas home on February 3, 1959.

He was born September 8, 1890, in Dublin, son of the late Seaborn J. and Sem Ruda Harber. He was graduated

DR. HARRY PAUL HARBER

from Dublin High School in 1911 and attended the University of Texas in Austin. He was a member of the school bands in both these schools and became a member of the Shrine Band in Galveston while studying toward his medical degree at the University of Texas Medical Branch. He received his degree in 1917.

Dr. Harber entered the United States Army in 1917 as a first lieutenant in the Medical Corps. Upon his discharge in 1919, he was at St. Francis Hospital in New York for a year of internship. Dr. Harber entered private practice in Dallas in 1920, doing general practice and surgery until he retired because of ill health in 1955.

A member of the Dallas County Medical Society, the Texas Medical Association, and the American Medical Association, Dr. Harber was also a long time member of the First Methodist Church of Dallas.

Dr. Harber is survived by two sons, Harry Paul Harber, Jr. of Los Angeles, and Capt. Ben Gill Harber, a member of the United States Air Force Dental Corps stationed in Anchorage, Alaska; a brother, Eugene Harber of San Saba; four sisters, Mrs. Ira C. Kiker and Miss Fannie Harber of Dallas; Mrs. Herbert W. Maas of Vernon; and Mrs. Tom F. Bryan (wife of the physician) of Dublin.

DR. L. B. WOODS

Dr. Limmie Bradford Woods, one of Texas' horse-and-buggy doctors and a former Lubbock city health officer, died at his home in that city on February 5, 1959.

He was born on May 17, 1887, in Bogata, the son of Oran Robert and Jane Woods. After receiving his preliminary education at Gibtown, Dr. Woods attended North Texas State College, Denton, and was graduated from old Southwestern University Medical College in Dallas in 1911. He did postgraduate work at St. Paul's Hospital, Dallas; Cook County Hospital, Chicago; Mayo Clinic, Rochester, Minn.; and New York Polyclinic.

Dr. Woods began his practice in Jacksboro in 1912, remaining there until 1924, when he moved to Wilson, Oklahoma. From 1931 to 1939, he practiced in Ardmore, Oklahoma, and after 1939, in Lubbock. The physician was Lubbock city health officer from 1948 to 1955, and he also served as city-county health officer for a time. He owned Woods Clinic, established in 1949.

A general practitioner, Dr. Woods was on the staff of Methodist Hospital in Lubbock. He was a member of the Lubbock-Crosby Counties Medical Society, the Texas Medical Association (of which he was elected an inactive member in 1958), and the American Medical Association.

During World War II, he was a lieutenant-colonel in the Texas State Guard. He was a thirty-second degree Mason, a Knight Templar and Shriner, a former member of the Lubbock Lions Club, and a member of Knights of Pythias. He served on the official board of the First Methodist Church in Lubbock.

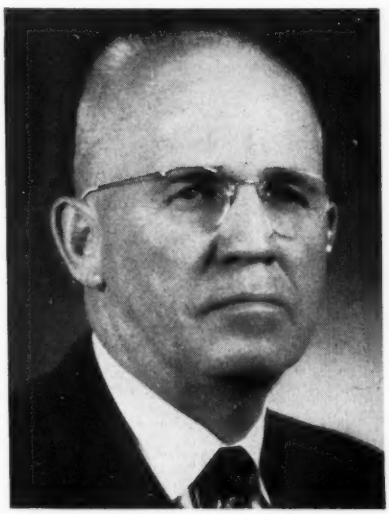
Dr. Woods and the former Miss Clara Ann Walters were married in Gibtown on September 4, 1910.

He is survived by his widow; three sons, Limmie Berkley Woods and James Henry Woods, both of Lubbock, and John Walters Woods, Duncan, Okla.; two daughters, Mrs. John T. Poland, Lubbock; and Mrs. Wendell D. Sparks of Hennepin, Okla.; three brothers, Dr. D. R. Woods of Lubbock and W. A. Woods and Charlie T. Woods, both of Perrin; six sisters, Mrs. Elizabeth Childers and Mrs. Nora Allums, both of Bogata; Mrs. Mary Bridges of Bagwell; Mrs. Brooks Trotter of Denton; Mrs. Viola White of Odessa; and Mrs. Maude Osteen of Jacksboro; and 10 grandchildren.

DR. G. HERBERT BEAVERS, JR.

Dr. George Herbert Beavers, Jr., of Fort Worth died in Galveston on January 6, 1958. Cause of death was penumonia.

Dr. Beavers was born in Benjamin, on December 31, 1898, son of Dr. George H. and Linnie (Dimmitt) Beavers. He attended the University of Texas, Austin, and received his medical degree with honors from Tulane University, New Orleans, in 1926. He interned at Touro Hospital in New Orleans, then doing his residency in obstetrics and gynecology at Woman's Hospital in New York. He was in private practice in Fort Worth from 1929 until his death, specializing in obstetrics and gynecology.



DR. L. B. WOODS

DR. G. HERBERT BEAVERS, JR.

The physician was a member of the Tarrant County Medical Society, Texas Medical Association, American Medical Association, and Southern Medical Association. He was a past president of the Texas Society of Obstetricians and Gynecologists, a fellow of the American College of Surgeons, and a member of Alpha Omega Alpha. Dr. Beavers was a member of the Christian Church. He belonged to the Rivercrest Country Club and the Fort Worth Club.

Dr. Beavers is survived by his wife, the former Miss Margaretta Graham, whom he married in Austin in 1922. She resides in Fort Worth. Other survivors are his mother, Mrs. G. H. Beavers, Sr., Fort Worth; two daughters, Mrs. James M. Moore, Marietta, Okla., and Mrs. William J. Bond, of Fort Worth; and one sister, Mrs. Frances Parks Mulky, Oklahoma City.

DR. ALLON K. HALL, JR.

Dr. Allon Killough Hall, Jr., 35, of La Porte died in a Baytown hosiptal February 7, 1959, after suffering a heart attack in his home.

He was born August 8, 1923, in Fort Worth, son of A. K. and Ruth (McRae) Hall. After attending San Angelo public schools, he completed his premedical studies at the University of Texas. He received his medical degree from Tulane University in New Orleans in 1946. He interned at Scott and White Clinic, Temple, and at the School of Aviation Medicine, Randolph Field. He served a residency at the University of Illinois Hospital, Chicago, and was a resident physician at the Veterans Administration Hospital in Houston.

DR. ALLON K. HALL, JR.

Dr. Hall was a flight surgeon and captain at Carswell Air Force Base from 1947 to 1949. He practiced in Mission for 5 years before moving to La Porte in 1956. At the time of his death, he was a practicing ophthalmologist, an associate professor of ophthalmology at Baylor University College of Medicine, Houston, and maintained an eye clinic in Baytown.

He was a member of the Harris County Medical Society, Houston Ophthalmological and Otolaryngological Society, Texas Medical Association, American Medical Association, and National Medical Foundation for Eye Care. He was a Methodist and Kiwanian, and his hobbies included flying, woodwork, and music.

Dr. Hall is survived by his wife, the former Miss Helen Jean Stroman of San Angelo, whom he married in 1944; four sons, Jimmy, David, Gary, and Tommy Hall; a daughter, Bonnie Hall, all of La Porte; his parents, of Baytown; and four sisters, Mrs. Helen Foster, Corpus Christi; Mrs. Luke H. Miller, Falls Church, Va.; Mrs. Mary Nugent, Baytown; and Mrs. James R. Paxton, Paxton, Palestine.

DR. EDWARD G. LYON

Dr. Edward George Lyon, who served nearly a quarter of a century with the Dallas Department of Public Health, died in that city on January 4, 1959, after an illness of 5 years.

Dr. Lyon was born in Pontotoc, Miss., on November 14, 1884, moving to Texas with his parents at the age of 7. After being graduated from Garland High School, he worked for the late Dr. Lyon T. Walker, who then owned the local telephone exchange, and for a drugstore. His ambitions thus aroused to become a physician, he attended Southwestern Medical School and was graduated from the University of Tennessee in 1911.

He practiced in Mississippi for 5 years, then returned to Texas to work in Sachse and Afton before settling in Dallas. In the latter city, he was superintendent of the old emergency hospital at one time located in Dallas' city hall, medical examiner with the food-handlers' division, and physician in the quarantine division. His service with public health was interrupted only by a few months of service with the Austin State Hospital. He retired in 1954.

A member of the Dallas County Medical Society and American Medical Association, he was elected an honorary member of the Texas Medical Association in 1954.

Dr. Lyon is survived by his wife; a son, Bob Lyon; and a daughter, Mrs. Walter Monroe, Jr., all of Dallas; and two sisters, Mrs. Claude Davenport of Shreveport, La., and Mrs. Cap Davenport of Madisonville, Ky.

DR. EDWARD G. LYON